# Railway Age

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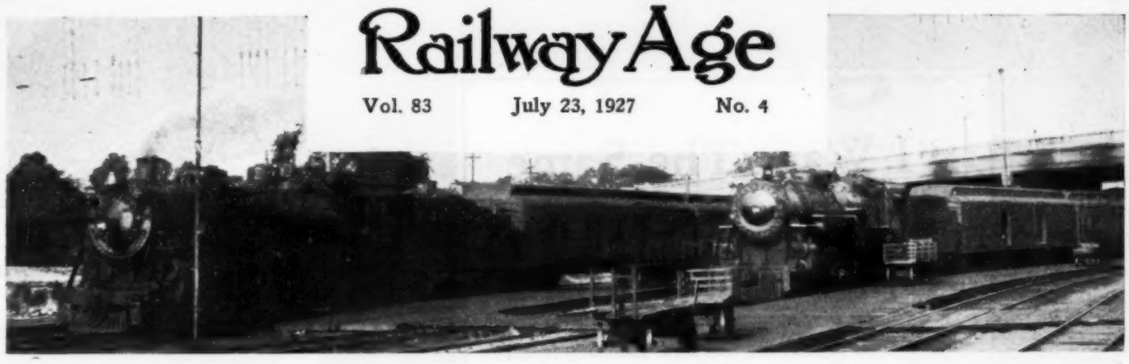

*An A. C. L. Train (Left) and a F. E. C. Train at Jacksonville, Fla.*

# Contents




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Railway Age

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[*Indexes to Volume 82.—The indexes to the last volume of the* Railway Age *are now ready for distribution. Those desiring indexes to this volume should advise the New York office, 30 Church Street.*]

## The Athletic Meet

THIS is the season when system and divisional athletic meets are numerous. The trained and balanced team of one division of a road is pitted against the representatives of the other. An understanding of the difficulties and exhilarations of athletic struggle forms a bond of sympathy between members of system or divisional teams. It makes it easier for them to work and move with a common purpose and extra energy not only on the field, but on the job, for it begets a ready familiarity with the fruits of co-operation.

## Lessons from the Scrap Pile

A RAILROAD scrap pile is not a very inspiring sight to most people; looked at in the right way, however, with discerning eyes and it becomes a veritable storehouse of information that may prove invaluable if properly appraised and utilized. It will illustrate, for instance, in a most forceful way, the careless use of tools and materials, some of which may have been discarded too soon and which may still possess possibilities of considerable service. It will show up defective material and help to guide the way to a better selection of materials for specific uses. It is a clearing house for the study of defective designs. All of these shortcomings or mistakes will be buried if close and critical attention is not given to the sorting of scrap by someone who recognizes and understands the really wonderful possibilities for progress and improvement, which can be more or less easily deciphered by one who has been properly trained for the task.

## Slow But Steady

THE industrial or commercial application of the products of inventive genius is marked with sharp contrast. Development in the use of the radio sprang up like a mushroom. Commercial application of the airplane has been more like that of a slow-growing tree. Progress has been steady but not sufficiently rapid to excite general notice. Much the same observation may be made with respect to the introduction of labor-saving devices in track work. Practical use has lagged behind progress in invention. Although nearly all railway officers have manifested interest in these appliances many have deferred application on their own roads on the ground that such equipment was applicable only to heavy service lines on railroads with large earnings. That this stage is rapidly passing is indicated by the fact that one of the western roads which is not numbered among the more prosperous lines recently completed the program of rail renewals on its major lines according to a plan under which all operations from the handling of the rail to the driving of the spikes were performed with mechanical appliances. Progress in this field has gained a greater momentum than is generally realized.

## Electric Traction in Europe

ELECTRIFICATION of railroads has made greater progress in Europe than in the United States and this fact is frequently commented upon about as follows: "Why is it that in the United States where we have made such wonderful strides in the electrification of every industry, the electrification of steam railroads has lagged behind that of Europe?" Much light is shed on this apparently difficult question by an article published elsewhere in this issue on "Factors Which Influence Electrification in Europe." It gives a picture of political conditions and lays stress on the importance of coal supply, these two factors accounting largely for the difference between European and American progress. The article also describes some of the formulae developed by European engineers for determining the traffic density which will justify electrification. The American engineer is inclined, also to discount European precedents because of the relatively large difference in train weights. Realizing these differences, however, and knowing the effects of political influence and the price of coal, he can learn much from European experience.

## The Superintendent's Freight Claim Responsiblity

THE division superintendent's duties and responsibilities have increased largely in all directions. Among his present manifold duties is that of assisting in freight claim prevention work. In this field he can be of very material usefulness, primarily because he is in close contact and has direct supervision over those employees who cause the damage. The freight claim prevention officer has a necessary function to perform, but in the final analysis, it is the superintendent and his train masters who must teach the men freight claim prevention. It is largely a matter of education. Damaged freight is seldom the result of premeditated negligence. In the main, aside from the unavoidable operating hazards, damage is causes by employees who are careless, who have not been educated to the fact that freight claims

are a heavy drain on the railway's revenue, a loss that may be materially reduced by proper care. An important development, and one that should be productive of results, is the allocation of freight damage by divisions. With the figures in his possession for his own division, the superintendent is in a far better position to make improvements than he would be if he were without definite knowledge of what carelessness on his division costs.

## *Signs on Railway Buildings*

THE average traveler is interested, among other things, in the railway business. During a journey, particularly when the scenery is not unusually inspiring, the vagrant interest of the traveler may be caught by almost anything. Advertisers have realized this long ago, as is evidenced by the billboards strung along the right-of-way all over the country. There is no reason why the railways should not also cash in on this receptive mood of the traveler. The Lackwanna has taken a step in the right direction by identifying its shops in Scranton, Pa., by signs, telling the traveler which is the erecting shop, the boiler shop, etc., and also impressing upon his mind that this large shop layout is a part of railroading. This practice should be more generally followed. Not only does it advertise the railway, but it gives the traveler some idea of the magnitude and extent of railway operations.

## *Controlling the Passenger's Impulse Toward Recklessness*

THERE may be some question as to the legitimate lengths to which one should go in saving the foolhardy from the natural consequences of their own folly. A case in point is the reckless automobile driver at a railroad grade crossing. Should he be arrested and punished for his recklessness? On the other hand, might not such chance-takers be allowed to suffer the natural results of their recklessness? The answer must obviously be in the negative, since the reckless driver at a crossing not only endangers his own life but that of innocent persons who may be riding with him, as well as railway employees and passengers—a collision with a highway vehicle not infrequently causing a derailment. With the careless train passenger, however, the situation is not entirely analogous. If the passenger tries to board or leave a moving train his own life is generally the only one which he places in jeopardy. But even here, do not the dictates of simple humanity require railway employees or police officers to restrain the individual where possible from unsafe practices? On suburban trains where open vestibule cars are provided dozens of foolhardy actions on the part of passengers can be noted each day. Not long ago at a suburban station where the two tracks are separated by a protective fence, a train a car or two longer than this fence was taking on passengers. The proceed signal was given and the train started to pull out. The rear brakeman chanced to notice an elderly woman who was just ready to attempt to board the moving train on the wrong side and about three feet from the beginning of the fence. "Get off of there!" he shouted and she obeyed. Quite apparently, however, she was very much angered and was not inclined to thank the man whose pre-emptory order saved her from certain death or serious injury. It is important to school railway employees in strict adherence to reasonable rules of safety, but this alone cannot make railway travel as safe as it should be; passengers must also be taught something of the same discipline.

# A Union Delegation to Russia—Perhaps

LAST week it was reported that a junket of labor union officers to Soviet Russia had been planned. These gentlemen were going over to "study conditions" and come back with well grounded opinions about the country—or such portions of it as the Bolshevik government saw fit to show them. They would then be in a position to advise President Coolidge and his Cabinet just what policy the United States should assume toward the U. S. S. R. Since the present policy is one of watchful waiting, presumably the backers of the labor union excursion hope for a report advocating a change in policy.

But alas! The plans does not seem to be progressing so well. The program was to finance the expedition by appeals to private individuals. Now the chance of collecting the $20,000 needed from unwary philanthropists seems to be jeopardized by the opposition of the American Federation of Labor which, knowing something of how Soviet sympathizers in this country have tried to sabotage the A. F. of L., is not looking kindly upon inclusion of its officers in the junket. If the federation continues this lamentable opposition, about the only official delegates left in the mission will be leaders of the railroad unions which are not affiliated with the A. F. of L. But perhaps, in spite of all obstacles, the party may be able to raise the necessary funds and really go upon its mission. It seems that many people who go to Russia to "study conditions" see more or less what they want to see, or what their hosts show them. At a recent meeting of the American Academy of Political and Social Science there were several speakers on the subject of our relations with Russia—all competent men—and the variation in their viewpoints was surprising. May we expect this proposed delegation made up of men who are certainly not expert in such subjects to aid materially in clarifying our views? Perhaps not—but it ought to provide a pleasant summer trip for the delegates, and there can be no harm in that.

# The Railways as a "Co-operative Enterprise"

COMPLETE statistics regarding the expenditures of the railways in 1926, some of which have only just become available, show that they were conducted last year as the country's greatest co-operative enterprise. Such an enterprise should, with improving results, yield increased benefits to everybody concerned, and this the railways did. The largest beneficiary was the public. The average rate per ton per mile it paid declined from 1.098 cents in 1925 to 1.082 cents in 1926. This may seem a small decline, but applied to the freight business handled it saved the public about $120,000,000. In addition, the public collected an increase of about $30,200,000 in taxes, making the total amount that it saved in rates and secured through increased taxes about $150,000,000.

In spite of the reduction of rates there was an increase in total earnings due to the handling of a largely increased traffic. Deducting the increase in taxes which

the public got from the increase of $257,000,000 in earnings leaves $227,000,000 of the increase in earnings to be accounted for. Over $96,600,000 of this was received by employees in increased wages, there having been an increase in the number of employees and also an advance in their average compensation. There was a decline in purchases of coal, but an increase in purchases of materials and supplies which made the net increase in the purchases of materials, etc., for operating purchases about $32,000,000. Almost $5,500,000 more was paid out in equipment and joint facility rentals and there were other increased expenses amounting to about $1,000,000, which left for the owners $92,000,000 increased net operating income.

The benefits to public, employees and owners mentioned aggregated $339,000,000, of which the public received 44 per cent, the employees 28.5 per cent and the owners 27.5 per cent. The investment of capital and the co-operation of shippers and employees with the railways made increased efficiency of operation possible. This increased efficiency of operation promoted the welfare of all concerned, and it is the only thing that ever has or ever will do so.

## An Opportunity— Will They Grasp It?

THE affairs of the Brotherhood of Locomotive Engineers are attracting considerable attention because of several developments that have transpired during the convention now drawing to a close. Unfortunately not a great deal is known of the events that have culminated in the rather startling disclosures and consequent drastic actions of the past few weeks.

Through the successful leadership of the late Warren Stone the B. of L. E. assumed a position where it not only has exerted a widespread influence in matters pertaining to organized labor but has become a financial power as well. Through various financial and industrial ventures conceived and materialized for the greater part through the untiring efforts of its late president the brotherhood has become an organization of considerable magnitude with assets in the neighborhood of $200,000,000 and in the activities of which over 100,000 persons are directly interested.

The abrupt ending of Mr. Stone's career left the brotherhood without another leader of equal caliber and capacity to carry out his ideas and at a time when the rapid expansion of its activities had demanded so much attention that the necessity of building up an executive organization trained in the successful handling of matters other than those associated with labor problems had probably not been fully realized. As a consequence the brotherhood is now passing through a crisis in its history upon the outcome of which may depend the extent of the organization's future power, wealth and prestige. Is it not also possible in a greater sense that through the solution of its own present difficulties the brotherhood may have within its grasp an opportunity to contribute immeasurably to the successful solution of one of capitol's most perplexing problems—that of its relations with labor.

As a labor organization the B. of L. E. has been successful probably because its leaders have, in most instances, recognized the value of fair dealing. As a whole, its activities in financial and industrial fields have not been unsuccessful in spite of the fact that some of its ventures have resulted in loss. Of paramount importance, however, is the fact that this organization has been compelled to deal with economic and social problems with which previously it has not permitted itself to be concerned.

Viewed in this light the influence of the brotherhood, especially as it relates to its 90,000 members, may be an important factor in the future of organized labor. These men, most of whom are rather conservative and straight thinking citizens, are virtually "stockholders" in a two hundred million dollar "corporation," in the success of which they are both personally and financially interested. It is unreasonable to presume that they would intentionally be instrumental in the establishment of policies relating to their own organization that would result in any impairment of their personal investment.

Through their divisional officers and delegates to the triennial conventions, these men have a voice in the affairs of the brotherhood. Their opinions concerning its problems will be tremendously influenced by the source from which they receive information concerning these problems. Their opinions will be tempered by the extent to which such information has influenced their individual thoughts. In the past the locomotive engineers have had to rely primarily on two organs for their information—Labor and the B. of L. E. Journal. The action of this year's convention in withdrawing its support from Labor would indicate that the brotherhood is not entirely in sympathy with the radical tenor of that publication's editorial policy. As for its own paper—the Journal—it now has a golden opportunity to take as a precedent the convention's attitude toward Labor and clean its own house by henceforth dealing more comprehensively with the broader and more perplexing economic problems with which the organization is confronted.

It is to be hoped that the B. of L. E. will come through the present crisis with flying colors and in its financial success gain a greater appreciation of the problems of capital. Warren Stone is said to have had a vision of a day when labor and the railroads could meet on the common ground of mutual understanding. Out of this convention may come the fulfillment of his hopes.

## New Haven to Sell Stock

THE New Haven's announcement of its plans to sell $50,000,000 preferred stock is only slightly less interesting than the success this company had in 1925 in refunding its European loan. At that time, the company carried out with striking skill the sale at par of $23,000,000 15-year 6 per cent bonds to the investors and patrons in its territory. It succeeded in doing so by appealing to the pride of the New England communities and by inducing them to see that by helping the railroad at that time they were, so to speak, taking out transportation insurance. The success of the sale was all the more remarkable because only two years before influential financial interests in New England had argued the necessity of receivership or reorganization. Indeed, in the five years, 1919 to 1923, the road had operated with a deficit and in 1924 it earned net after charges $3,000,000, equaling only $1.90 a share on its common stock.

The possibility of financing with stock is testimony of the additional progress that has been made since the 1925 refinancing. In 1925, the net income after charges increased to 7½ million or $4.72 a share and in 1926 to over 8 million or $5.25 a share. The New Haven follows the Frisco, Southern, Atlantic Coast Line, Balti-

more & Ohio, New York Central and the Bangor & Aroostook in financing by means of stock. It is the first in this group that does not pay dividends on its common stock and the first the common stock of which does not sell above par. This explains the necessity for the road's resorting to an issue of cumulative preferred stock.

The newspaper editorial writers have been quick to see the popular interest in the New Haven's financing with stock. Quite properly, they treat the present proposal as indication of "a remarkable comeback." They do not fail to point out that New Haven stock, prior to the debacle of 1913, had been for years the mainstay of many New England fortunes; it paid dividends of from 7½ to 10 per cent for 40 years and at times the stock sold as high as $300 a share. Overexpansion in the form of attempts to secure a complete monopoly of all transportation in New England, supplemented by inefficient management that was the cause of one of the worst accident records in the country's history, brought on adversity. From this, recovery was retarded by the war, federal control and the shop strike of 1922, the effects of which in New England were particularly severe. The low point in New Haven fortunes was reached in 1923 and for an extended period its stock could have been purchased at from $9 to $20 or practically at receivership prices. Improved managerial efficiency, a heavy increase in traffic, the expenditure of many millions of dollars for new yards at strategic points, larger power, heavier bridges, etc., improved service and remarkable success in securing the good will of the New England population explain the present progress to recovery. The road has by no means regained its former position of prestige. The prices of its securities are evidence of that. The common stock today sells for about 51.

The new preferred stock will be 7 per cent cumulative. It will be offered at par to present stockholders in the ratio of one share of new preferred to four of present stock and to holders of the company's 6 per cent convertible debentures maturing in 1948 in the proportion of one share of new preferred to each $400 face value of the debentures. The amount of new stock will, therefore, be $49,036,700. The new stock will be convertible par for par into common stock and the company has the right to redeem it at $115.

The purpose of the issue is to pay off part of the road's indebtedness to the federal government. This totals $87,030,000. It matures in part in 1930 and the remainder in 1935 and, of course, carries 6 per cent interest. It is expected that if a large share of this loan is paid off the remainder can be refunded more economically. The saving in interest on the government loan to be paid off through the present plan will amount to $2,942,000. On the other hand, the 7 per cent preferred dividends will total $3,432,000 but this will not be a fixed charge and accordingly the effect on the company's credit will be helpful. The excess of the dividends over the interest will amount to $490,000 or 31 cents a share on the common stock. The company estimates that it would have been able in 1925 and 1926 to earn the preferred dividend requirements 3¼ times.

The New Haven has an inconvenient relationship of bonds to total capitalization, the present proportion being two-thirds long term debt (inclusive of the government loan) to one-third stock. By the new arrangement the proportion will become 43 per cent of stock to 57 per cent of bonds. The effect on the company's credit will readily be appreciated.

It was not easy to expect that the New Haven would have been able so soon to become one of the small number of roads that have announced their plans of raising new capital by the sale of stock. Under the conditions the management must be credited with having commendable courage—that same degree of courage that attracted much favorable attention at the time of the 1925 refinancing.

# Light for Wall Street

COMMENTING upon a recent editorial in the *Railway Age*, the Wall Street Journal said in an editorial on July 2, "Let us stretch our imaginations to the bursting point and suppose the Supreme Court to have sustained Mr. Eastman's theory of valuation. Would the *Railway Age* then say that it was the court that had 'wiped out several billion of invested capital'?" The *Railway Age* answers, "Yes," without any hesitation. If invested capital is wiped out, the result is the same whether due to a decision of a commission or a court.

The confusion of mind which caused the Wall Street Journal to ask the naive question quoted is indicated by the last two sentences in its editorial in which it says, "The *Railway Age* does not know any better than Joe Eastman or Will Rogers what the invested capital of the railroads is. That is just the question which the Supreme Court will be asked to answer."

We take the trouble to point out that in the railroad business there is a great difference in the meaning of the terms "invested capital" and "valuation." "Invested capital" means the amount of capital, measured in money, that actually has been invested. "Valuation" is the process used, and also the result arrived at, in determining what is the present value of the property in which the investment has been made. Now, "the question which the Supreme Court will be asked to answer" is not "what the invested capital of the railroads is." The question it will be asked to answer is as to the way in which a valuation should be made of the property in which the capital has been invested.

The distinction between railroad "invested capital" and railroad valuation is a very practical and important one, in spite of the fact that it has eluded the writer of the editorial in the Wall Street Journal. When he says, "the *Railway Age* does not know any better than Joe Eastman or Will Rogers what the invested capital of the railroads is," he means to imply, we suppose, that nobody knows what it is. But "invested capital" and "cost of construction" are ordinarily used as synonymous, and "cost of construction" to date is one of the things that the Interstate Commerce Commission is required by the LaFollette valuation law to try to ascertain. The commission has found that it cannot determine exactly what the cost of construction to date is. It has, therefore, adopted a method for determining it approximately. It has held that the unit costs of 1914 are approximately representative of previous construction costs. Therefore, it applies them to the inventories of the railways, excepting land, as of 1914, adds the investment since made, and decides that the total actual investment to date, excepting in land, is approximately the resulting figure. Does it base the valuation on this figure? It does not. It first makes a large deduction from it for alleged "depreciation," and then adds land and working capital. The result in most cases is a "valuation" much less than the commission's own estimate of "invested capital."

It is bad enough for Main street to be ignorant on the subject of railroad valuation without having Wall street also unenlightened. The Wall Street Journal can get a great deal of information by reading the opinions of the members of the Interstate Commerce Commission in the O'Fallon case, and also by reading several editorials and articles that have been published recently in the *Railway Age*.

*In the Sunnyside Yard of the Pennsylvania, Where 400 Pullmans are Serviced Daily—New Storehouse on Left*

# Pullman Supply Operations Widely Scattered

*Stores and laundries extend from coast to coast to serve cars and passengers—But turnover is rapid*

Part I

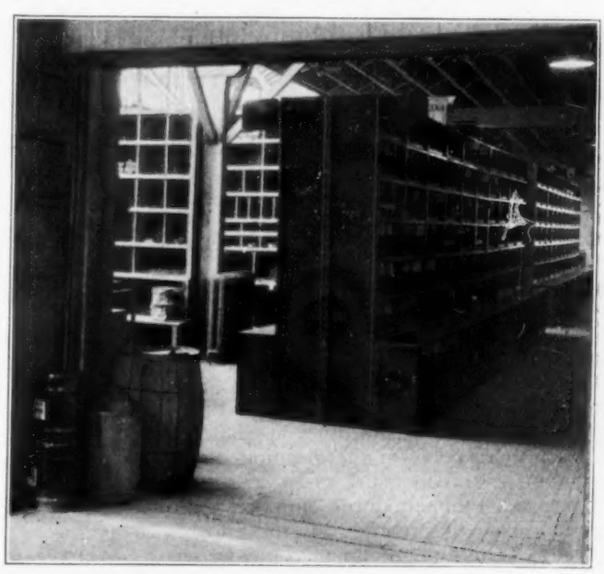
IN connection with the operating of its cars, the Pullman Company maintains a stores organization comprising 149 storehouses scattered throughout the United States and extending into Canada and Mexico. The disbursements from these stores, excluding transfers of material between stores and also all linen, average around $21,000,000 a year,—equivalent to the business of a good sized railroad. Yet, the stock carried only averages about $3,500,000, representing a turnover of stock of about six times a year.

Much of the stock is similar to that carried by railroads. This company issued 17,729 air hose during 1926, 731,867 electric light globes, 57,237 dry batteries, 776,386 axle belts, 43,885 window panes, 6,941 prismatic glasses, 56,354 steam hose and couplings, 184,600 journal bearings, 33,546 oil boxes, 700,378 brake shoes, 157,862 yards of plush, 52,012 window screens, and 117,619 yards of floor carpets.

Other supplies issued during 1926 include 4,527,733 boxes of matches, 4,216,946 cakes of soap, 126,868 gal. of liquid soap, 103,493,474 drinking cups, 5,696,890 hat bags, 46,740 mops, 37,156 brooms, 11,701 fly killers and 61,128 first aid packages.

### Wash a Million Pieces of Linen Daily

In addition to the foregoing, there were 677,045 new bed sheets supplied in 1926, 667,820 new pillow slips, 1,471,852 new hand towels, 61,550 new porters' coats and 31,500 new blankets. The figures of total stock on hand do not include linen but it is interesting to note that replacements of this material amount to about $900,000 a year and the entire supply in use and in storage represents an investment of $4,000,000. About 1,000,000 pieces of linen are washed every day by the Pullman supply department, this work being done in no less than 59 private laundries scattered throughout the country, and in six company laundries, the latter having a capacity of 200,000 pieces or 60 tons per day. The repair of this material alone requires the employment of 100 seamstresses while 392 checkers and carriers are required to handle it between the Pullman cars and linen room, all working under the supply department. The annual payroll of the store department, exclusive of linen handlers, exceeds half a million dollars.



**Steel Shelving Has Partially Replaced Wood at Several Points**

The need of a supply organization of such proportions

arises from the responsibilities this company assumes in its contracts with railroads not only to furnish, often at a moment's notice, the proper number and kind of cars called for in winter or summer, fair weather or foul, but also to keep these cars in good repair and supplied with all the needs of the travelers in addition to a smiling Ethiopian to spread the linen and put the Aurora Borealis on pink slippers and black shoes. There are 8,981 Pullman cars in service. In meeting the varied demands for car service with never a hitch and without undue expense, the provisioning side of the business is vital.

### Five Repair Shops

What is required in repair work is emphasized, for the reason that this company's activities in this direction are for the most part under-estimated. Railway employees inspect the running gear of all cars in active service and make the repairs necessary to keep the equipment in a safe condition. But in most cases the repair parts are obtained as needed not from the railway but from Pullman storerooms.

The Pullman company also maintains its own force of mechanics, electricians, car cleaners, in practically every sizeable railroad coach yard in the country. These mechanics and electricians maintain the various heating, plumbing, lighting and other appliances on the cars and the cleaners perform the cleaning operations inside the equipment and in many cases on the exteriors as well. It is from Pullman storerooms that the repair parts, and soap, mops, etc., required by these forces come.

Besides this the Pullman company has its own repair shops which are located at Chicago, Buffalo, Wilmington, Del., St. Louis, and Richmond, Cal. Here all cars are shopped periodically. Mattress ticks are cleaned, the upholstering is washed and re-dyed if necessary, carpets are renovated and many new appliances, such as the electric fans, generators and batteries, water and air valves are entirely removed from the cars for processing. The interior and exterior surfaces of the car bodies are painted or varnished or both and draft gears, trucks and brakes are overhauled.

In addition, many of the foregoing operations, such as the renovating mattresses and cleaning of air brake equipment, must be performed one or more times between the regular shoppings of the cars, which require the removal of such material in the various districts and their shipment to the nearest repair shop.

Each shop must have sufficient material available for the overhauling of all the appliances removed from these cars as well as for the cars undergoing the regular or special shopping. The Buffalo shop is typical of the five plants maintained for such purposes. Here about 850 cars are subjected to regular shopping each year and about 800 to special treatment. Material valued at more than $500,000 must be carried to meet these needs for supplies which average around $235,000 per month and reach a peak value of more than $300,000 a month during the spring when the shopping program is heaviest.


**Map Showing Cities in Which One or More Pullman Storerooms Are Located**

From the nature and volume of this work, the bulk of repair stock is carried at these repair points, while the remaining repair stock and the bulk of all servicing supplies are carried in 144 stores scattered from the Pacific to the Atlantic and from the St. Lawrence river and the Great Lakes to the Gulf. These stores range in size and importance from those located at small outlying points where four or five cars are handled per day to that serving the Pennsylvania's Sunnyside yard at Long Island City, where as many as 400 Pullman cars, enough to make a train more than six miles long, are conditioned every day and which requires a supply organization of 77 persons as follows:

1 Storekeeper
3 Assistant storekeepers
4 Storeroom clerks
1 Stenographer
2 Linen clerks
3 Stock clerks
2 Clean linen counter clerks
2 Soiled linen counter clerks

1 Hamper repairman
10 Car linen checkers
9 Car equipment and supply checkers
2 Car linen checker counter carriers
2 Head linen carriers
3 Clean linen sackers
1 Linen counter
4 Liquid soap dispensers
4 Storeroom laborers
22 Linen carriers
1 Soiled linen test counter

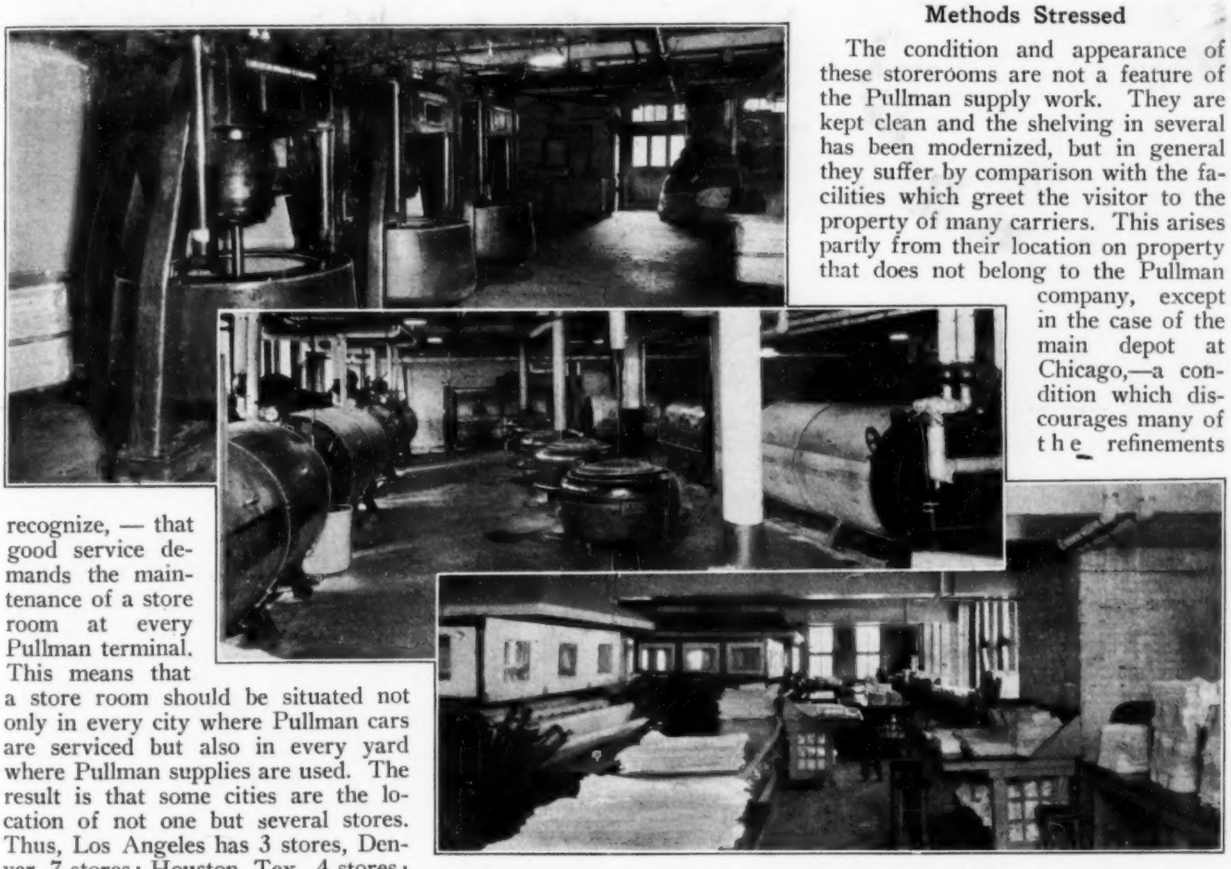
### Stores from Coast to Coast

To render the service required and at the same time to escape the unwieldiness and waste that are the traditional weaknesses of an organization whose boundaries are so far flung has been the great problem of this department. In accomplishing this, one essential has been thoroughly recognize, — that good service demands the maintenance of a store room at every Pullman terminal. This means that a store room should be situated not only in every city where Pullman cars are serviced but also in every yard where Pullman supplies are used. The result is that some cities are the location of not one but several stores. Thus, Los Angeles has 3 stores, Denver, 7 stores; Houston, Tex., 4 stores; Omaha, Neb., 4 stores; Minneapolis, 7 stores; Kansas Sity, Mo., 5 stores; St. Louis, 5 stores; Cincinnati, 5 stores; Pittsburgh, 3 stores; Buffalo, 3 stores; Detroit, 4 stores; Atlanta, 15 stores; and Chicago no less than 17 stores, including the repair shops.

It is the policy of the Pullman company to replenish these points as much as practicable from a central store and thereby secure all the benefits of the purchasing in bulk and of stock control that come from centralization. But it has only been practicable to carry out this idea in a modified form. The actual arrangement is one determined by a long experience with operating conditions at each point and an intimate study of the material handled. Under this plan storerooms are divided into four classes: A main store, central stores, district stores, and sub-stores. There are 43 sub-stores throughout the country of which 15 are located in Chicago. Each of these stores depends for supplies upon some one of the 101 district stores located in 53 cities. The district stores are much larger than the sub-stores and, with one exception, assume the responsibility of depending for all replenishments upon the main store in Chicago. Where experience has shown that certain commodities are used in quantities that will warrant direct shipments of material from the manufacturers or where the point in question is at the source of certain material, as in the case of material coming from the repair shop, then the district store in question becomes a district central store upon which designated district stores in the same city or vicinity depend for the replenishment of those items. Except in these particulars, all district stores and the district central stores are supplied from a main store located at Chicago.

### Methods Stressed

The condition and appearance of these storerooms are not a feature of the Pullman supply work. They are kept clean and the shelving in several has been modernized, but in general they suffer by comparison with the facilities which greet the visitor to the property of many carriers. This arises partly from their location on property that does not belong to the Pullman company, except in the case of the main depot at Chicago,—a condition which discourages many of the refinements which have become prevalent in this field of construction, but the principal reason is found in the stand taken that with the inconspicuous position occupied by the storerooms and the kind of material carried, appearance and arrangement of buildings count but little so long as space is adequate and the location right.



**In the Cincinnati Laundry of the Pullman Company—Upper: Large Extractors—Center: Washers and Small Extractors—Lower: Multi-roll Ironers, Folding Tables and Conveyors which Feed the Tying Machine**

With the internal operation of these stores, however, it is a different story. In 1923, the Pullman company decided that if an occasional overhauling was good for a Pullman car it might also be good for the supply department and it called in a firm of industrial engineers to study the situation. The result has been a system of supply work that is marked for its simplicity and dispatch.

Note: The concluding article will be published in a subsequent issue.

# Pennsylvania Builds the First Plate Fulcrum Master Scale*

*Years of study and development lead to construction of new weighing device with unusual accuracy and sensitivity*

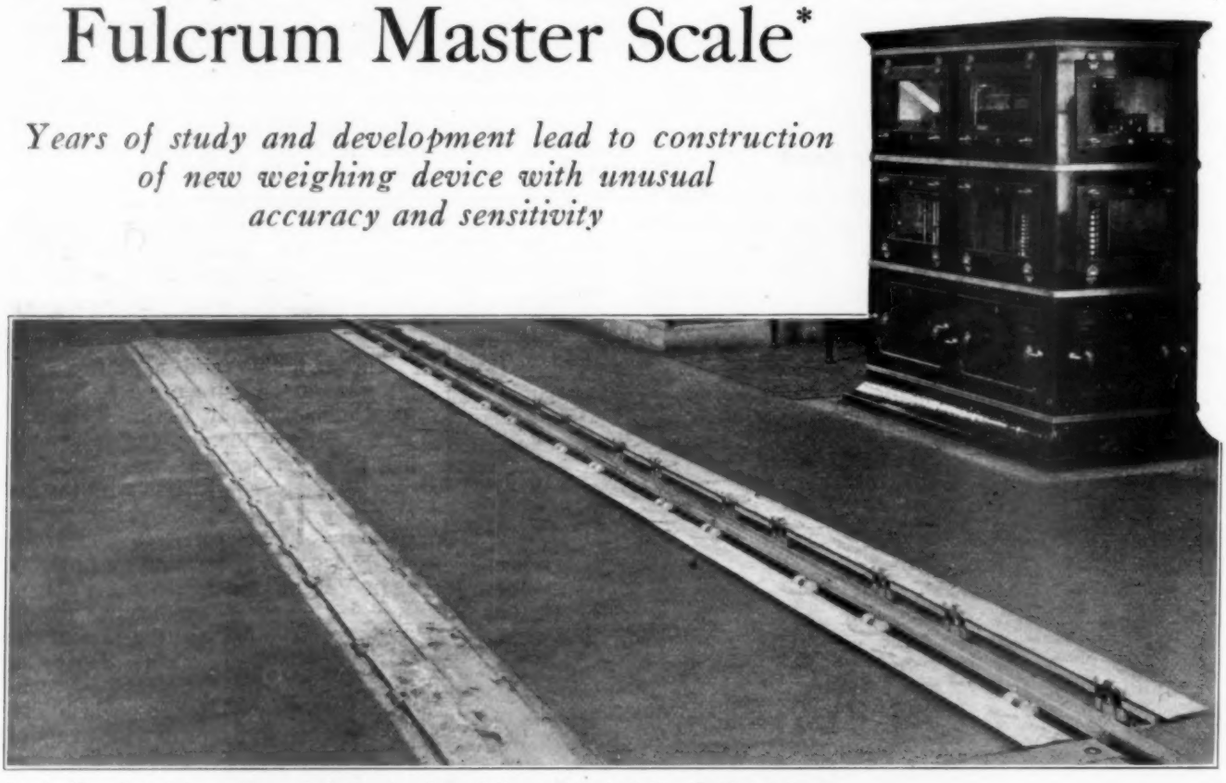


*Fig. 1—New Plate Fulcrum Master Scale Showing Beam Cabinet and Scale Rails with Hinged Covers*

OWING to the fact that the revenue derived by the railroads for freight transportation is based directly upon the weight of the shipments handled, the accuracy of the weighing devices used is of the greatest importance. This is particularly true of the track scale on which an exceedingly large proportion of such weights must be determined, and therefore makes apparent also the large importance of the unquestionable accuracy in the weight of test cars used for the calibration of such scales, and the still greater importance of the accuracy of the master scales which determine initially the weight of all such cars.

Recognizing these facts, the Pennsylvania Railroad, which handled 230,000,000 tons of freight in 1926, and therefore has a right to a keen interest in knowing that its weigths are correct, has given much study to the design, development and construction of track scales, test cars and master scales. While this has resulted in constant improvements in the weighing equipment on that road, the most recent and outstanding development that has taken place, is the construction of a new 150,000-lb. capacity, two-section, plate fulcrum master track scale, which is the first of its kind to be built, and which exceeds in many respects the sensitiveness and accuracy of the other types that have been used on the Pennsylvania. This new scale, which has been installed within the new scale shop of the Pennsylvania at Altoona, Pa., is the outgrowth of a gradual development during the last 12 years, within which time the application of the plate fulcrum principle to track scales has been studied in minute detail.

*Adapted from a paper presented at the twentieth National Conference on Weights and Measures held at the Bureau of Standards, by A. W. Epright, supervisor of scales and weighing, Pennsylvania Railroad.

### The First Plate Fulcrum Track Scale

Approximately 260 track scales are owned and used currently by the Pennsylvania for weighing both loaded and empty cars. Prior to 1915, all of these scales were of the knife-edge type, with continuous weigh-bridges, and were almost entirely of the four-section type. During 1915, the first plate fulcrum track scale was installed at East Tyrone, Pa. This experimental installation was of the four-section type with an articulated weigh-bridge, Fig. 2, but owing to its complicated construction and the expense incident to its manufacture, together with the difficulty experienced in this type of scale, as well as in the knife-edge scales, in getting responsive action to all sections of the scale during the weighing operation and under varying temperature conditions, the suggestion arose of developing a two-section design of plate fulcrum scale. Such a scale was built, and the two-section design proved so successful in every respect that it was adopted as standard for all new construction on the Pennsylvania. As a result, some 28 track scales of this type, shown in Fig 3, in lengths of 52, 62 and 75 ft., are now in regular service on this road. The advantages of the plate fulcrum over the knife-edge type of track scale are numerous, including such important factors as economy in maintenance, absolute freedom from friction, definite control of sensitivity, uniformly correct indications, and continuity of satisfactory service under practically any or all operating conditions.

To permit the ready calibration of all track scales, and to prove the continued correctness of such scales at the required frequency, without undue expense, it is necessary to provide test weight cars. Such cars are, in reality, portable test weights which may be handled in

train service. Since the most important requirement for this class of equipment is, obviously, constancy in the actual weight, these cars, as designed and built by the Pennsylvania for its own use, are of the most approved type. They are self-contained, and so constructed as to shed quickly all rain and snow, and are of the roller bearing type. This last feature is especially valuable in that the repacking of the journal boxes while the cars are enroute, with the attendant erratic changes in weight, is eliminated, and the power required to move the cars from point to point along a scale during a test is greatly reduced. Test weight cars on the Pennsylvania are operated in pairs, each consisting of one 40,000-lb. car and one 80,000-lb. car and each pair is scheduled over a definite route at approximately three-month intervals. Each route starts and ends at a master scale, at which point the cars are thoroughly cleaned, inspected and reconditioned, the weight of each car being recorded as it arrives at the master scale, and again when necessary reconditioning has been completed and the car is ready to be sent out again.

### The New Two-Section Plate Fulcrum Master Scale

The Pennsylvania has for some years maintained three master scales, the most important of which, from the standpoint of the number of its test weight cars calibrated, is that located in the system scale shop at Altoona. Shortly after the completion of the first plate fulcrum track scale at East Tyrone, the need of a more satisfactory master scale at Altoona became apparent, particularly since test weight cars had been developed which were more constant in weight under service conditions, which made it desirable to provide a facility at this point

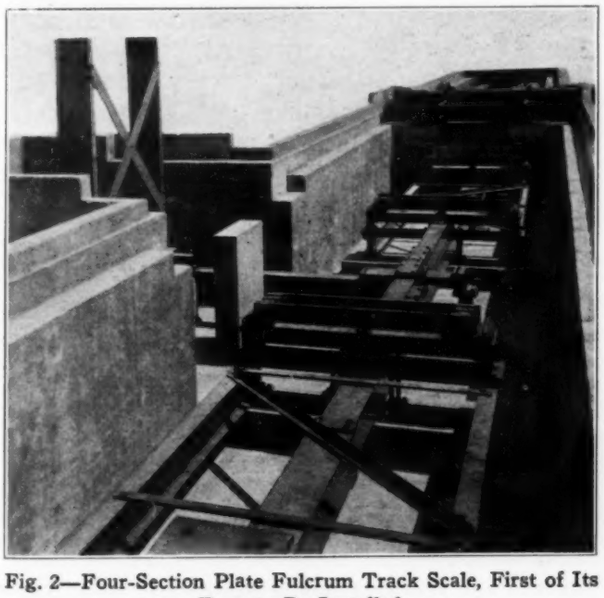


**Fig. 2—Four-Section Plate Fulcrum Track Scale, First of Its Type to Be Installed**

for checking the weights of test cars, which would be beyond question at all times.

When the scale shop at Altoona was moved recently, therefore, to a new and larger building the new, most recently developed type of plate fulcrum master scale, the first of its kind in the United States, and possibly in the world, was constructed. In the design and manufacture of this scale (Fig. 1), the following general principles were adhered to:

(1). That it should conform to the general specifications of the American Railway Association for master scales of the knife-edge type, insofar as those specifications were applicable.

(2). That it should be installed under cover in a location as free as possible from vibrations due to machinery, train or other causes, and where it would not be run over by cars or material not to be weighed.

(3). That it should be used primarily for calibrating test weight cars or for other special weighing where extreme accuracy might be required, and should not be used for general weighing.

(4). That it should be of the two-section type, with multiple of 100:1 at the butt of the beam.

(5). That the scale rail should be 12 ft. long, and should be located centrally over and entirely inside the span of the

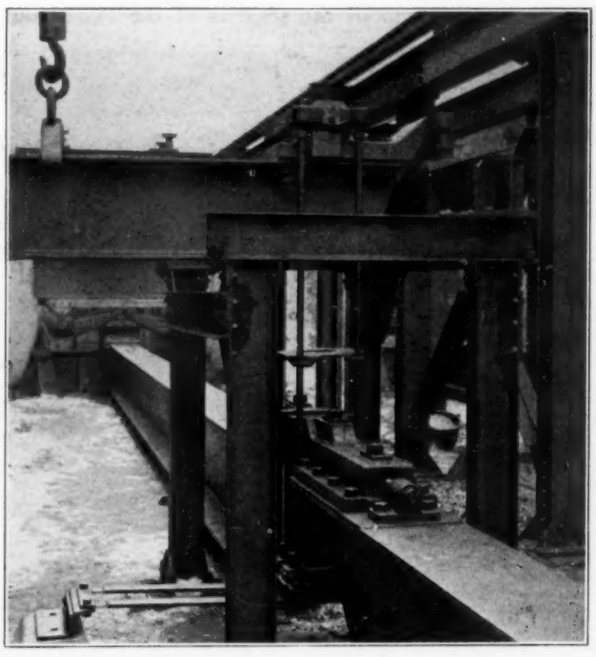


**Fig. 3—Two-Section Plate Fulcrum Track Scale of Most Recent Design**

scale bridge. The approach tracks should be on a tangent for at least 25 ft. in each direction from the scale.

(6). That the capacity of the scale should be 150,000 lb.

(7). That it should be capable of adjustment, and that the maintenance of such adjustment should be possible within the limits shown in the following tabulation:

| Test Load in Pounds | Tolerance in Pounds For Adjustment | For Maintenance |
|---|---|---|
| 20,000 | 3.00 | 6.00 |
| 30,000 | 3.68 | 7.36 |
| 40,000 | 4.24 | 8.48 |
| 50,000 | 4.75 | 9.49 |
| 60,000 | 5.20 | 10.40 |
| 70,000 | 5.62 | 11.22 |
| 80,000 | 6.00 | 12.00 |
| 90,000 | 6.37 | 12.74 |

(Note.—The figures shown in the above tabulation are those adopted by the U. S. Bureau of Standards and by the Scale committee of the American Railway Engineering Association.)

(8). That the design and installation of the scale should be such as to enable the above tolerance requirements to be consistently met and the adjustment of the scale to be constant.

In addition to the forgoing general principles, the further requirement was laid down by the management of the Pennsylvania, that regardless of the Bureau of Standards' tolerances, the new scale was to be consistently accurate to the irreducible minimum limit.

### Details of Construction

Some of the more important details of construction of the new scale are described as follows: The inside dimensions of the pit, which is of monolithic reinforced concrete, are 24 ft. long by 11 ft. wide by 10 ft. 2⅞ in. deep. The inside dimensions of the neck of the pit are 6 ft. 8 in. long by 9 ft. wide, the neck being covered

with a concrete ceiling supporting the beam cabinet, reinforced to sustain within the permissible limits of deflection, the weight of the cabinet and the load transmitted to it by the beam rod. All piers supporting any part of the lever system were bush hammered and carefully rubbed down to exact level, while the walls or piers forming a part of the foundation, rigidly support the approach tracks. The entire vault foundation is waterproofed to prevent moisture and subsequent corrosion. Access to the interior of the pit is by means of a stairway leading to the neck.

The lever system of the scale is of the two-section

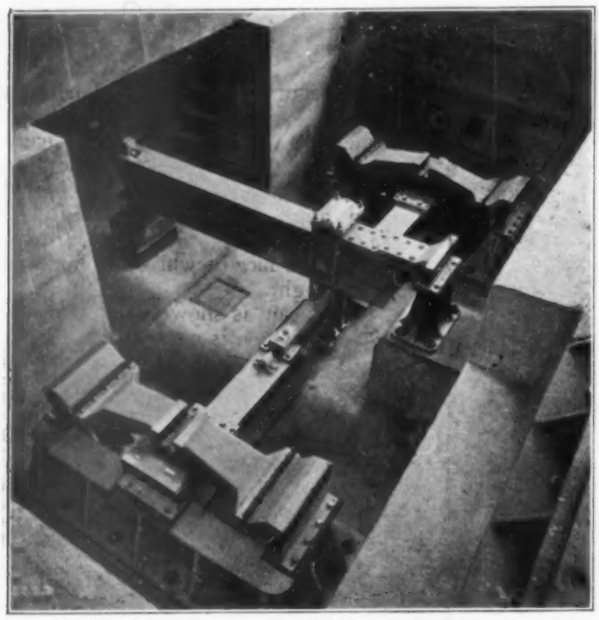


**Fig. 4—Lever System of Two-Section Plate Fulcrum Master Scale**

type, the multiples of the various levers being as follows: Main levers, 3½:1; longitudinal extension levers, 6 6/7:1; transverse extension lever, 4 1/6:1; total multiplication to butt of beam, 100:1. The arrangement of the lever system as installed in the pit is shown in Figs. 4 and 5.

In the design of the new scale every effort was made to incorporate parts which were already standard in the existing 52, 62 and 75-ft. track scales. Therefore, the main base plates, fulcrum stands, main levers, connections between main and longitudinal levers, heel castings, nose irons and connections between longitudinal and transverse extension levers, are all standard parts. The main base plates are of cast iron, and machined top and bottom surfaces. These are secured to the foundation by means of cinch anchor bolts which were placed after the base plates were accurately spotted. The fulcrum stands are bolted to the upper surfaces of the main base castings, and are accurately doweled to exact location.

### The Fulcrum Plates

The fulcrum plates throughout the lever system correspond in form to the standard design used in connection with track scales, and are made of special chrome vanadium steel, known as Cruco Fulcrum Steel, having the following physical properties:

| | |
|---|---|
| Elastic limit | 95,000 lb. |
| Ultimate strength | 125,000 lb. |
| Elongation in 2 in. | 21 per cent |
| Reduction in area | 61 per cent |

These plates were given a special heat treatment, after which they were machined and ground to exact dimensions, and jig-drilled to permit interchangeability of like parts. In order to insure absolute interchangeability, all surfaces against or on which the fulcrums bear are accurately finished to exact planes. This provides perfect contact and freedom from initial strain in the plates when they are secured in place. No plates are used in direct tension.

Both the longitudinal and transverse extension levers of the scale are of composite construction, these, in each case, consisting of a 20-in., 140-lb., H-section beam, to the ends of which special castings are fastened securely by means of taper-fit alloy steel bolts. The casting at the butt end of each lever is designed to receive the butt fulcrum plate and load plate, while the casting at the tip end of each lever is designed to receive, in full machined ways, the nose iron, the movement of which is controlled by an adjusting screw. The selection of the section used as the main part of these levers was based on a deflection limit of 1/64 in.

The connection between the two longitudinal extension levers and the transverse extension lever is made by means of a rocker loaded platen which is suspended from the transverse lever, and to which the load is applied by compression, through vertical connections with the longitudinal levers. These connections are provided with fulcrum plates at both top and bottom, and micrometer adjustment is provided at the bottom in order to permit exact vertical alinement under the loaded fulcrums. The primary purpose of the compression connection is to compensate for changes in length of the longitudinal levers, caused by temperature variations, which, without this arrangement, would affect the accuracy of the scale. The load platen is stayed to the foun-

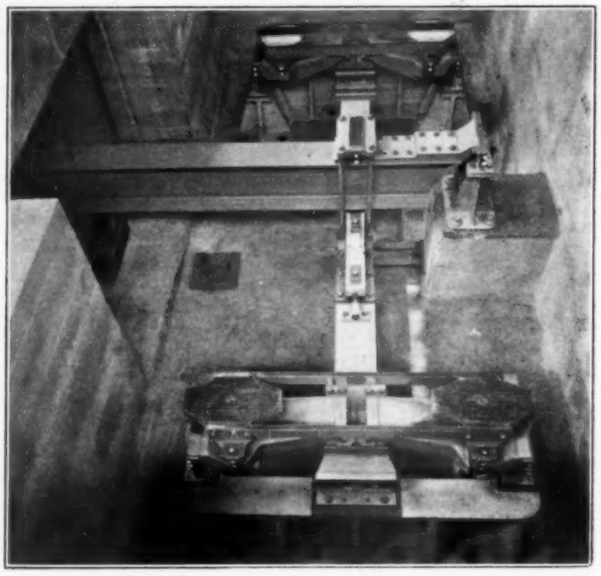


**Fig. 5—Lever System of Two-Section Plate Fulcrum Master Scale with Bearing Plates Attached**

dation in order to maintain its position accurately, and for the same reason a stayrod is also applied between the tip end of the transverse extension lever and the pit wall. These stays permit free vertical movement, within the necessary limits, of the scale parts to which they are bolted.

### The Weigh-Bridge, Weigh-Beam and Indicating Mechanism

The weigh-bridge consists of one 30-in., 180-lb. girder beam under each of the 12-ft. scale rails. These

beams, which are heavily cross-braced, are supported on the main bearing plates of the lever system through suitable cross girders. On the bridge combination cross-ties and rail columns of cast iron are mounted, accurate alinement of these castings being obtained by means of machined steel pads which are welded to the upper surface of the girders at proper points. The weigh-bridge is stayed by a plate applied at one end to prevent both longitudinal and transverse motion, as shown in Fig. 6, and by a stay-rod applied at the other end to prevent transverse motion.

The entire pit is covered with a steel deck supported by steel channels and at such elevation with respect to the scale mechanism that the tops of the scale rails fall below the top surface of the deck. The openings which are necessary on account of this condition are covered by hinged steel plates when the scale is not in use, which present no obstacle to walking across the deck. When

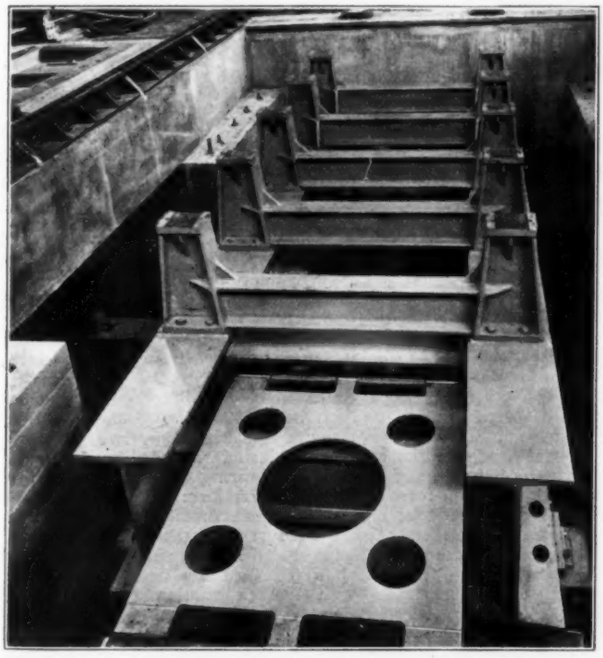


**Fig. 6—Arrangement of Scale Bridge and Stay Plate with Rail Columns Installed**

the scale is in use, these plates are turned back, as shown in Fig. 1. Having experienced some difficulty on account of air currents through these comparatively large openings, a series of baffle plates was later introduced to break up the air currents. Arrangements were also made to maintain more uniform temperatures in both the pit and the beam cabinet with thermostatic control. The surface of the steel deck is coated with mastic, 1⅜ in. thick.

The weigh-beam mechanism of the scale is entirely enclosed in a cast metal frame cabinet provided with hinged plate glass windows, as shown in Fig. 7. A glass partition in this cabinet is provided between the operating handles and the rest of the cabinet, so that even when the scale is in use, no air currents can strike the beam. The interior of the cabinet is illuminated by a series of incandescent lamps.

### Scale Has High Sensitivity and Accuracy

The connection from the tip end of the transverse extension lever to the weigh-beam, which is located in the upper section of the beam cabinet, is through a twin steelyard rod which passes through an oil seal at the base of the beam cabinet. The load thus applied to the butt of the beam, 4 in. from the main fulcrum, is counterbalanced by three groups of telescopic counterpoise weights. The first of these groups, which consists of nine 100-lb. weights, is located 8 in. from the beam fulcrum; the second group of nine 1,000-lb. weights is located 20 in. from the main fulcrum, and the third group of fourteen 10,000-lb. weights is located 40 in. from the main fulcrum. The fractional bar is graduated at 1-lb. intervals up to 100 lb., and the use of an vernier poise on this bar permits accurate readings to be taken to the nearest 1/10 lb. The beam is sensitive to this amount under a load of 100,000 lb. and, by means of adjustment provided, can be made much more sensitive than this without the usual tendency to become unstable.

The manipulation of both the telescopic weights and the vernier poise is controlled by operating levers in the middle section of the beam cabinet. This operating mechanism is interlocked mechanically with the beam-locking device in such a way that no telescopic weight can be applied or removed at any time unless the beam is locked. The amount represented by the telescopic weights, when applied to the beam, is indicated to the weigher by vertical bars connected with the operating mechanism, on the face of which are numerals that correspond to the weight.

The equilibrium of the beam is shown by the position of the indicator or pointer which is connected to the tip of the main beam to magnify its motions. The tip of this pointer moves across a graduated arc, the middle graduation of which corresponds to a horizontal position of the main beam. Zero load balance of the weigh-beam is obtained by two balancing weights which have screw adjustment. The sensitivity and frequency of the beam are controlled by vertically adjustable weights supported on spindles and located respectively over the main fulcrum of the weighbeam and the fulcrum of the indicator pointer. The tendency of the beam to respond to outside influences is controlled by means of an oil dashpot in which vertical oscillation of the beam causes horizontal displacement of the oil in the dashpot which is connected with and operated by the indicator referred to above.

### Internal Operating Mechanism

The telescopic counterpoise weights, and the vernier poise used on the fractional bar, are gold-plated to prevent tarnishing or change in mass due to oxidation, as are also the spindles supporting the telescopic weights. Before being applied to the scale, these weights were submitted to the Bureau of Standards where they were tested. As a result of these tests the Bureau furnished a certificate to the effect that the weights had been found to be correct within the limits of tolerances for class "A" weights and to remain constant within one-fifth of these tolerances during a period of three months.

The lower section of the beam cabinet is devoted entirely to the weight-operating and interlocking mechanisms. The manipulation of the telescopic weights is accomplished by means of a rack and quadrant mechanism suitably counterbalanced to obtain uniform resistance when raising or lowering the spindles which control the telescopic weights. When the sealed and tested counterpoise weights and the fractional poise were received at Altoona from the Bureau of Standards, the weigh-beam was set up and the beam was sealed to the weights on the basis of the established multiple at the butt of the beam, of 100:1. After this had been done, the beam was connected to the scale proper and the scale was carefully tested up to 100,000 lb. with carefully calibrated weights.

The weights used in this test had been sealed previously by the Bureau of Standards, and the probable error of the entire nest of weights had been determined to be 0.24 lb., a value materially less than the tolerance adopted by the Bureau for this class and quantity of test weights. With this small probable error, the maximum probable error of test weight cars sealed over the new scale will not exceed 0.75 lb.

In calibrating the new master scale, the weights were applied at each end and at the center of the scale. While this condition of loading does not correspond to either

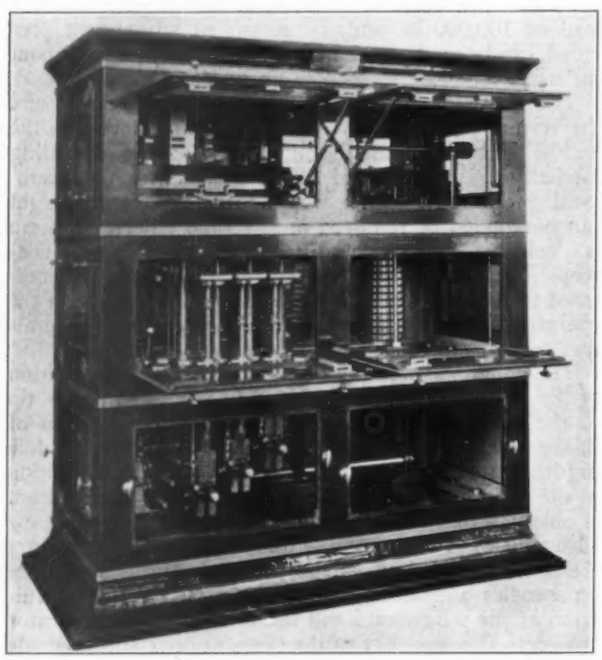


**Fig. 7—Beam Cabinet Showing Beam Indicating and Control Mechanism, Also Telescopic Counterpoise Weights**

actual weighing or to the load used by the Bureau of Standards in their routine master scale tests, it is believed that the method of concentration used constitutes a more severe test than with the load applied on four wheels. In view of this, it is also believed that when the official Bureau of Standards test is made the performance of the scale will be even better than that determined by the tests made up to this time, in which a maximum error of 0.5 lb. under a load of 100,000 lb. has been developed.

The original design for the new plate fulcrum master scale was prepared under the direction of A. H. Emery (deceased), former civil and mechanical engineer, Glenbrook, Conn., while the work of redesigning the scale was done in the engineering department of the Pennsylvania at Altoona, and was participated in by A. S. Vogt (deceased), former mechanical engineer; R. N. Miller, assistant engineer; and A. W. Epright, supervisor of scales and weighing, of the Pennsylvania.

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THE JAPANESE MINISTRY OF RAILWAYS has approved a scheme submitted to it by the Osaka municipality for the construction of a new underground and elevated rapid transit system, says a report to the Department of Commerce from Assistant Commercial Attache, H. H. Ehlers, Tokyo. The proposed system is said to involve an ultimate expenditure of 162 million yen. The projected line is 33.65 miles long, of which 13.07 miles will be underground and 20.58 miles elevated.

# Train Orders on D. & R. G. W.

WASHINGTON, D. C.

THE Interstate Commerce Commission has made public a second supplemental report, by W. P. Borland, director of its Bureau of Safety, on the collision on the Denver & Rio Grande Western near Granite, Colo., on August 20, 1925, in which it is said that the officers of the road "have taken energetic measures to correct the conditions" which were criticised in the former reports with respect to the handling of train orders.

The original report on this collision, dated October 8, will be found in the *Railway Age* of November 14, 1925, page 905; and the supplemental report, covering the investigation made to see whether the recommendations made by the Bureau had been carried out, was made on February 23, 1927, and was reported in the *Railway Age* of March 5, page 668.

The collision, between westbound passenger train No. 7 and eastbound passenger train No. 8, resulted in the death of two employees and the injury of 96 passengers and 21 employees. An operator, having many train orders to deal with, confused them, and failed to deliver No. 71; and many other irregularities were found. The supplemental investigation said that no apparent improvement had been made.

The conclusions of the report now under review are as follows:

The second supplemental investigation indicated that there were still a few irregularities to be cleared up, such as (1) the use on the Grand Junction division of a form of order not provided for in the rules, which has the effect of avoiding the use of a middle order, (2) the issuance of work-train orders which are in conflict in their provisions relative to the protection to be offered by the work extra involved, this condition being located on the Salida division as well as the Grand Junction division, and (3) the occasional issuance of orders to work trains which have the effect of reducing time orders so far as approaching trains are concerned, requiring the use of an order to these trains on form 31 instead of on form 19.

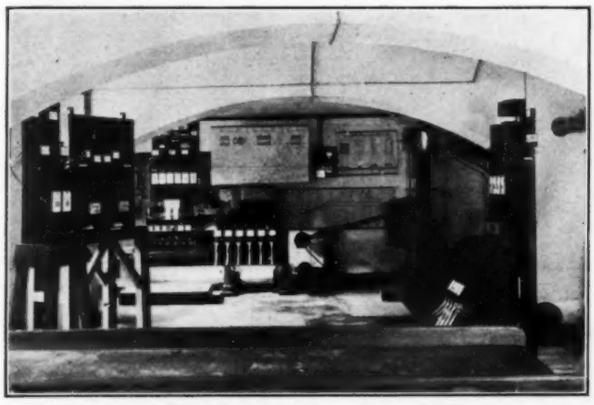
In the report covering the original investigation the loose methods which then existed with respect to the handling of train orders were pointed out in rather emphatic terms. After waiting a period of one year or more the first supplemental investigation was made with the expectation of finding an improvement in the situation. That such was not the case, however, was made clear in the report of February 23, 1927. It had been the intention to wait several months after the issuance of this report in order to give the operating officials ample time to take such remedial measures as they might desire and then to undertake a second supplemental investigation. At the request of the president of the railroad, however, the time of this investigation was advanced, with the result that only a few weeks elapsed between the time of the publication of the report of February 23, 1927, and the time when the records were again examined in the second supplemental investigation, these records being those dating from April 15 to May 15. It was clearly apparent, however, that good use had been made of the time available and the situation as it existed during the period covered by this second supplemental investigation is a contrast rather than a comparison to that which formerly existed and furnishes a striking example of what can be done in the way of changing practices which, in some cases at least, appear to have been in existence for years. With the exception of the three items mentioned in the first paragraph of these conclusions, only a few minor irregularities were found among all the thousands of train orders and clearance cards examined. This bureau has not had occasion to make such an investigation into the train-order practices on other railroads and for this reason no comparison can be made, even if it were considered advisable, but it is clear that the officials on this railroad have taken energetic measures to correct the conditions which previously existed, and in view of the short period of time at their disposal it is felt that these measures have been attended with an unusual degree of success. A continuance of these efforts, with close supervision on the part of division officials, will result in the maintenance of a high standard of operation under the train-order system, which should reduce to a minimum the possibility of the occurrence of collisions similar to the one which occasioned these investigations.

# Psychological Tests on the German Railways

By Uthai Vincent Wilcox

THE German railways have recently installed psycho-technical schools for locomotive engineers. The school in Dresden is equipped with a number of rooms similar in appearance to a locomotive cab.

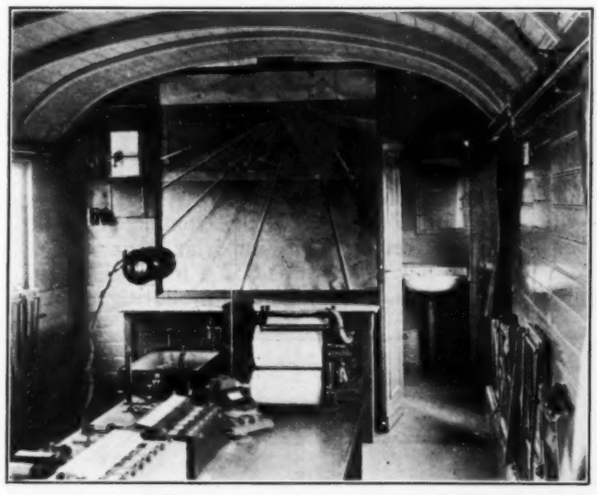
The school examiner taking one man at a time orders him to sit at a window where there appears a stretch of



**Laboratory Where Signal Instruction and Tests Are Given**

track in every way similar, except for being stationary, to the view from the cab of an actual engine.

The student is then called up suddenly to deal with obstacles, signals and difficulties as in actual service. He must tell the examiner just what he would do in any given emergency as the various views along the track appearing out of the window are put before him. He is



**Room Where Road Operating Tests Are Made**

not regarded as competent to drive a locomotive until he has demonstrated that he has the requisite knowledge, nerve, resourcefulness and initiative.

Another of the tests required in this German locomotive school requires the students to find the right keys to the locks of various boxes within a given time. At first a comparatively long time is allowed then it is shortened to test the student's ability to act quickly and with absolute precision. The plan is to obtain co-ordination of muscle and eye.

Most individuals, German psychologists say, find it difficult to open their own front doors in a hurry, even though they are entirely familiar with the keys on their key ring. With someone calling for "Help!" within the house many men become confused and cannot find the right key. These engineers must unfailingly find the right key for the right lock and within a few seconds.

This unique school has arranged working and laboratory rooms which make the enginemen familiar with the various signal and switching devices. This is on the theory that they will be better able to understand signals concerning the working of which they are entirely familiar.

Some of the final instruction is conducted in a specially equipped car. This school car can be sent from place to place and the students made familiar with all the various critical sections of the railway lines. While traveling theoretical instruction is accompanied by pictures, sketches, diagram and maps. Various mental tests are thrown into the instruction without previous warning for the purpose of testing alertness.

# Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended July 9, which included the Fourth of July holiday, amounted to 839,308 cars, a decrease of 58,248 cars as compared with the corresponding week of last year and a decrease of 147,585 cars as compared with 1925 All districts and all classes of commodities showed decreases as compared with last year, the largest being in coal loading, which was 32,240 cars less than that for last year The summary, as compiled by the Car Service Division follows:

**Revenue Freight Car Loading**

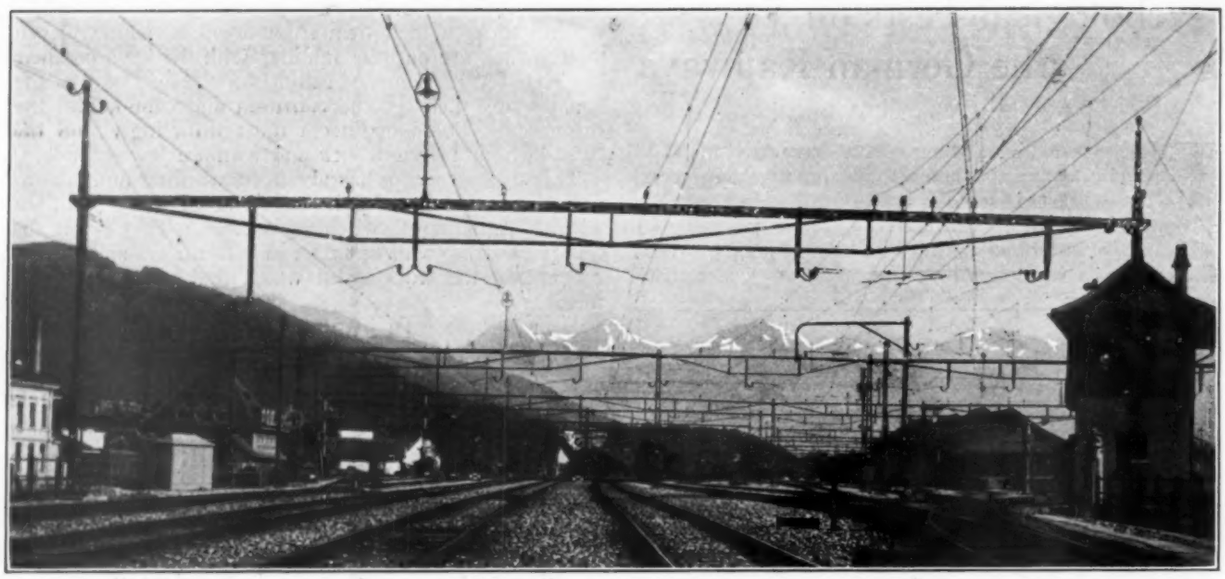
Week Ended Saturday, July 9, 1927

| Districts | 1927 | 1926 | 1925 |
|---|---|---|---|
| Eastern | 186,216 | 205,053 | 233,224 |
| Allegheny | 173,344 | 182,185 | 199,929 |
| Pocahontas | 46,473 | 48,905 | 51,348 |
| Southern | 126,323 | 130,561 | 136,213 |
| Northwestern | 129,414 | 135,164 | 150,432 |
| Central Western | 116,083 | 127,052 | 138,806 |
| Southwestern | 61,455 | 68,636 | 76,941 |
| Total West. Districts | 306,952 | 330,852 | 366,179 |
| Total all roads | 839,308 | 897,556 | 986,893 |
| Commodities | | | |
| Grain and grain products | 36,185 | 42,697 | 38,284 |
| Live stock | 23,143 | 25,819 | 27,693 |
| Coal | 115,318 | 147,558 | 162,080 |
| Coke | 9,567 | 10,873 | 9,384 |
| Forest products | 48,759 | 52,097 | 61,238 |
| Ore | 57,047 | 65,150 | 66,192 |
| Mdse. l. c. l. | 220,412 | 223,576 | 254,192 |
| Miscellaneous | 328,877 | 329,786 | 367,830 |
| July 9 | 839,308 | 897,556 | 986,983 |
| July 2 | 1,021,262 | 1,065,641 | 866,199 |
| June 25 | 1,018,206 | 1,055,362 | 993,173 |
| June 18 | 1,016,351 | 1,036,643 | 984,583 |
| June 11 | 1,028,305 | 1,052,471 | 989,873 |
| Cumulative total, 27 weeks | 26,166,034 | 25,906,707 | 25,315,473 |

## Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 9 totaled 61,628 cars, an increase over the same week last year and an increase over the same week last year of 2,229 cars.

| | Total for Canada | | | Cumulative Totals to Date | |
|---|---|---|---|---|---|
| Commodities | July 9, 1927 | July 2, 1927 | July 10, 1926 | 1927 | 1926 |
| Grain and Grain products | 5,836 | 5,283 | 4,563 | 194,504 | 187,290 |
| Live Stock | 1,747 | 1,359 | 2,002 | 52,102 | 53,569 |
| Coal | 6,723 | 5,697 | 5,833 | 170,843 | 131,907 |
| Coke | 256 | 206 | 201 | 8,577 | 10,680 |
| Lumber | 4,200 | 3,621 | 4,087 | 97,723 | 96,261 |
| Pulpwood | 2,193 | 2,000 | 2,675 | 102,818 | 81,710 |
| Pulp and Paper | 2,075 | 1,878 | 2,549 | 60,301 | 68,007 |
| Other Forest Products | 2,119 | 2,513 | 2,548 | 85,370 | 89,664 |
| Ore | 1,568 | 1,976 | 1,624 | 41,300 | 42,011 |
| Merchandise, L. C. L. | 18,120 | 13,872 | 17,311 | 452,682 | 427,932 |
| Miscellaneous | 16,791 | 13,215 | 16,006 | 364,704 | 355,440 |
| Total Cars Loaded | 61,628 | 51,620 | 59,399 | 1,630,924 | 1,544,471 |
| Total Cars Received from Connections | 32,426 | 33,766 | 34,313 | 1,034,484 | 1,005,347 |



*Thun Yard Electrification, Switzerland*

# Factors Which Influence Electrification in Europe

*Economic reasons for electrifying are reduced to formulae —Actual installations are greatly affected by political influence*

By Kent T. Healy

Formerly Cost Engineer, Electric Transmission Department, New York, New Haven & Hartford

THE electrification of European railroads has more than ordinary interest for American railroad men today, because members of certain communities are fired with enthusiasm for abolishing steam and forcing electrification, while the railroads are interested in the possibility of economies and better operation by electric traction. A view of the various influences making for electrification in Europe and guiding its development is therefore of interest and possibly also of value in explaining away any unfavorable references that may be made to the immense percentage of electrified mileage in some of its countries and the small amount of mileage electrified here. We may also see more complicated factors coming into play from a political point of view in Europe from which America is fortunately free.

### Coal Supply

Probably the irregularities of the coal market in Europe have had as much to do with the adoption of electric traction and its rapid advancement since the war as any other single factor. In Switzerland, for instance, the reason has not been that the normal cost of coal has brought the economies of electrification up to such a point as to justify the change from steam operation so much as that conditions caused by war or industrial disturbances in other countries from which Switzerland must of necessity import coal have forced electrification. It is true that normal coal prices in Switzerland are high as compared to those of America, averaging about $9 per ton in 1924 at the frontier, and a little over $8 in 1925; yet it is more important that the Swiss were forced to pay as much as $32 a ton in 1920-1921, due to abnormal conditions in coal-producing countries

**Section of Three-Phase Electrification on the Italian State Railways Near Genoa**

on the continent. With possible war embargoes the supply might not be sufficient at any price. Coupled with this is the fact that Switzerland is fortunate enough to have sufficient water power to displace the coal power on her railroads and place her in a decidedly more stable and secure position as far as motive power is concerned.

Italy is in a similar position, being dependent upon other countries for her main coal supply and at their mercy in case of war or labor upsets. She, too, is fortunate to a certain extent in having water power at hand, though it is not distributed as conveniently as in Switzerland. Italy is also favored with some sources of low grade fuel which are available for railroad power. Coupled with this is the motivating spirit of nationalism, so powerful today, which looks forward to the complete self-sufficiency of Italy and which accordingly demands that Italian transportation systems be made free from the domination of coal-producing nations at the earliest possible date. The strength of this movement can be seen at once when one compares the electrified route mileage in 1920 of about 600 miles with that at the end of 1926 of about 1,100 route miles, or including that under construction of about 1,700 miles.

In Austria, though coal is not generally as expensive as in Switzerland or Italy, still it is practically all procured from outside sources, such as Silesia, Poland and Czecho-Slovakia; any step toward making Austria independent of this import is a political desideratum. At the same time the Austrians have a supply of water power in the western part of their country which is far in excess of their present industrial needs and which can be used to decided advantage in replacing coal power used on the railroads.

Sweden is another country which has scarcely any coal resources, but is well endowed with waterpower and a national transmission system. This source of power is located advantageously for main lines of the railroads in the south, hence the utilization of it as a means of supplying motive power makes her independent of the coal countries.

Thus it can be seen that the political importance of economic independence of coal supply has been an active cause in the electrification of railroads in at least four European countries that were fortunate enough to have sufficient waterpower to displace the coal—namely, Austria, Italy, Sweden and Switzerland. It can be safely said that it has been the main motivating cause in Switzerland and Italy where an accelerated program of electrification has been put into effect. This is a very decided point of departure from any American electrification, because America is so well supplied with coal and oil and because in the regions of the heaviest traffic, industrial demands have made such great inroads upon the potential waterpower, that very little of such power is left for the railroads should they desire to use it.

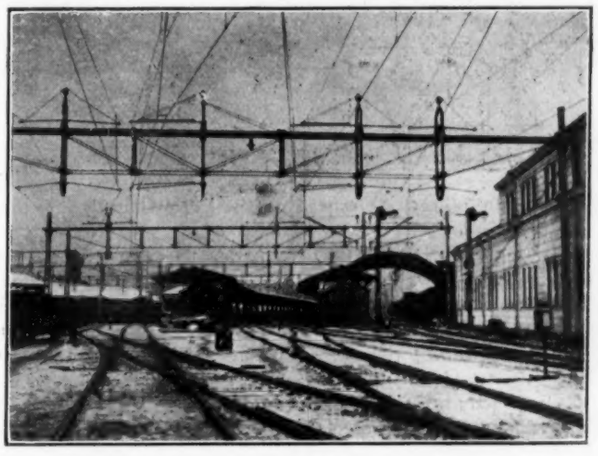
### Nationalization

Since there is government operation of several railroads in Europe, they are looked upon as a factor of considerable importance in the development of nationalization, binding the parts of the country together in social and political ways. Accordingly any method of bringing the various parts nearer by more rapid means of transport is regarded with high favor by the directing bodies. Electrification is favored because of the well-known possibilities of increasing speed and capacity of trains due to the greater power that can be concentrated economically in one locomotive.

In Austria, for instance, the running time of express trains has been reduced about 30 per cent from Bludenz on the Swiss frontier to Innsbruck along the main line going east and west across the country. On a shorter single track line of about 64 miles length the time has been shortened 35 per cent for passenger trains and 31 per cent for freight. In Germany in the Silesian mountain district, a similar performance has been shown over 93 miles of double track with a saving of 30 minutes on express trains, 60 minutes on locals, and as much as 3 hours and 35 minutes on freight trains.

The Swiss have speeded up their through routes considerably with electric traction. The time from Basel in the northwest corner to Chiasso on the Italian frontier, via the Simplon tunnel, a distance of about 190 miles, has been shortened an hour from 6 hours and 47 minutes. The 144-mile stretch from Zurich to Chiasso was covered in 5 hours and 19 minutes by the fastest steam trains and now with electric service it requires only 4 hours and 37 minutes.

In Holland marked improvements in schedule speed are expected with the introduction of electric multiple unit passenger trains in place of steam service. The present time of 96 minutes between Rotterdam and Amsterdam, a distance of 52 miles, will be covered in 66 minutes. With a traffic of about 30 to 35 trains per day each way this will mean a great saving of time and virtually will bring the two cities much closer together.



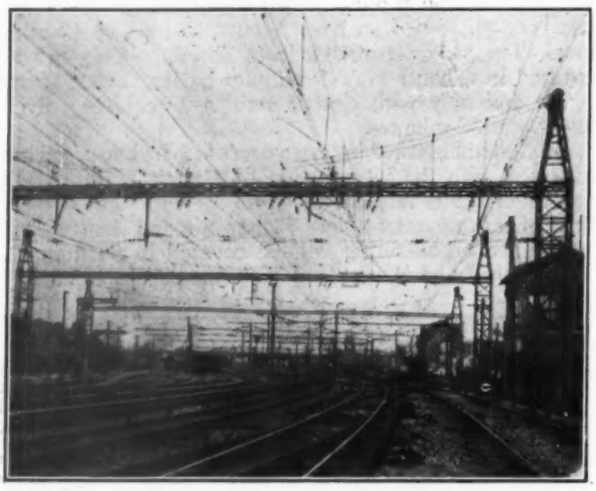
**Stockholm Station, Swedish State Railways**

In the cases of Austria and Switzerland, the faster service has an added value. With active competition for east and west bound traffic between Germany on the north, Switzerland in the middle, and Italy on the south, and with competition for north and southbound traffic between Austria on the east, Switzerland in the middle, and France on the west, any saving in time means a greater bidding power for the traffic. In this way Switzerland hopes to hold the France-Vienna traffic in her hands rather than let it go through lower Germany. Austria likewise hopes to be able to compete with Switzerland for the Italy-Berlin traffic, and so on.

Several of the European countries with government railroads have definitely included the electrification of the railroads as a part of their program to ameliorate the unemployment situation. They feel since the railroad is a government institution it should work for the welfare of the country as a whole. It is considered proper that the government railroad should be legitimately called upon to help the people tide over a period of industrial depression even if at some loss to itself. This is, of course, a factor that would never develop under private ownership with present economic standards, because it would be detrimental to the commercial success of the

road. In Austria, for example, a decision was reached to give employment to from 20,000 to 30,000 men over a period of about three years thus also providing 300 local firms with work in connection with the electrification program started at the time of the rehabilitation of the railroads. That country adopted a definite policy of purchasing everything from home industries with a result that only 25 per cent of the money for electrification failed to go to Austrian supply companies.

Decision was reached in Switzerland to hasten the work of electrification in 1923 and the budget was increased about $10,000,000, in order to afford work, in spite of the fact that it was an unfavorable time to buy material. It was estimated that 80,000 workers would get at least part time income from this source and that only a quarter of the cost of electrification would go to foreign countries—and that only for raw materials.



**Multi-Track Overhead on the Paris-Orleans**

The German railroads are the only ones that have been influenced toward electrification through economies gained by one-man locomotive operation. Due to the rigid economy measures forced upon them by the Dawes agreement they have looked to every means of reducing man power regardless of labor objections. They have been able to initiate a safe practice in electric locomotive operation without a fireman or helper by having the conductor or other member of the train crew ride in the engine. Some of the local managements have added restrictions, such as limiting the speed for one-man operation in passenger service to about 47 m.p.h. and the weight of the train to 330 tons, but even with these limitations they have run 95 per cent of their locomotive mileage without a helper. This has of course meant a tremendous saving, that might easily throw the balance of saving due to electric operation in its favor.

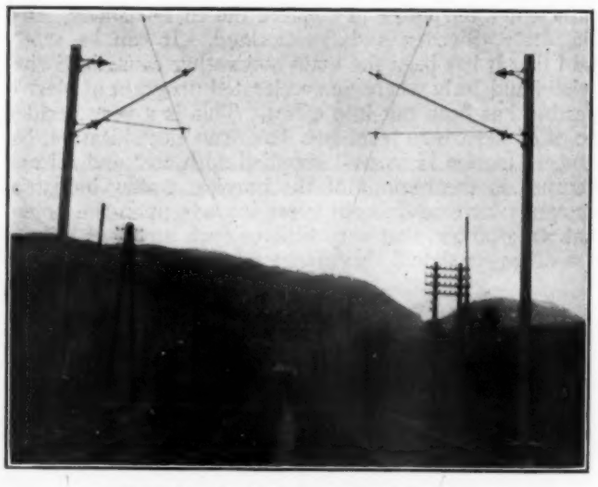
### Analysis of Economics by Formula

The economies of electrification have been studied carefully by the European railroads and in several cases sufficient saving has been shown to justify the investment necessary to change over from steam operation to electric. Several methods of analysis have been used, samples of which are interesting not only as examples of the method in question but also as to their numerical results. Mr. Parodi of the Paris-Orleans Railroad has developed a type of analysis that is characteristic of the group that attempts to find whether electrification is economically justified on a given section of line on the basis of the coal price and traffic density on that section. The Swiss Federal Railroad has worked up an analysis that is typical of another type that attempts to study a given network under different conditions of traffic and coal price on that network. The Germans have presented a still more complicated and correspondingly interesting type of analysis which takes into account more varying conditions and includes cost of power, cost of locomotive maintenance, and different interest rates.

**Table No. 1**

Analysis of Electrification Economies as Developed by M. Parodi
(Franc considered at 7 cents)

| Item of expense per mi. of road per year. | Method of expressing item in terms of price of coal per ton (C) and quantity of coal consumed per mile of road (Q). | Expression of Items Steam Operation | Electric operation |
|---|---|---|---|
| Coal cost. | Tons of coal consumed per mile of road per year, times the price of coal per ton during that period. | QC | |
| Electric power cost. | Tons of coal consumed per mile of road per year divided by the number of tons of coal to generate a kilowatt hour (6.6 lb.) times the price per kwh. (7 mils). | | 312 Q |
| Locomotive maintenance saving. | The locomotive mileage is derived by dividing the tons of coal used per mile by the amount used on an average per loco. mile (100 lb.). This loco. mileage multiplied by an arbitrary term based on experience representing the saving in locomotive maintenance per mile gives the total saving per mile of road. | $\frac{2000\ Q\ (0.16+.015C)}{100}$ | |
| Capital cost of electric distribution system and substations. | Capital outlay of $28,200 per mile of single track, times 7.5 per cent for interest and depreciation. | | 2120 |
| Maintenance and operation of same. | One per cent of capital outlay is allowed for operation and maintenance. | | 282 |
| | Totals for different systems representing: | QC+20Q[Q16+.015C] Fuel and loco. maintenance costs of steam operation. | 2.12Q+2402 Additional expense of electric operation plus energy costs. |



**Austrian Main Line Electrification**

The study of electrification economies as worked up by Mr. Parodi has the main thought behind it that at a given coal price there are certain sections of road that have a density of traffic great enough to show economies if electrified. Since the expense of coal is the major sav-

ing to be effected he concludes that the ton-miles carried over a given section of line are not as good a unit to judge by as the coal consumed to carry those ton-miles over that section. In that way he arrives at coal consumption per year per unit section as his gage of the situation as regards traffic density.

As a fundamental part of his study Mr. Parodi has assumed to start with the assumption that the capital outlay for electric locomotives will not be any more than for new steam locomotives. This he says is true in spite of the fact that electric locomotives cost more than the steam, because the electric machines are available for service a greater part of their life and because they are able to haul heavier trains and make faster movements. In other words, the cost of electric locomotives per ton-mile-hour produced is not higher than steam locomotives.

With this factor eliminated Mr. Parodi proceeds to set up the various expenses which are affected by electric operation in any large degree. These expenses he exexpresses in terms of the units he is interested in, namely, the price of coal and the coal consumption per mile of road per year. Table 1, shows these different expenses itemized and expressed in terms of the two units. When the savings due to electric operation in fuel and maintenance become equal to or greater than the additional costs of operation, maintenance and interest on the electrical system, electrification becomes justified. The

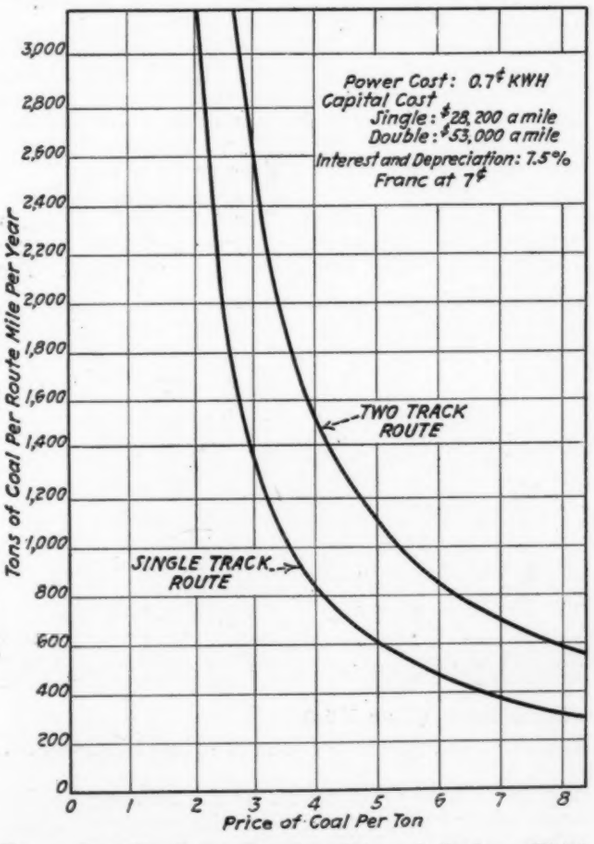



**Fig. 1—Parodi's Curve Showing Price of Coal at Which Electrification Is Economical with Any Particular Coal Consumption per Unit Length of Line**

border condition of equality is the point of interest and it can be studied by making the savings equal to the added charges. This equating of the savings and the expenses gives an equation in terms of the price of coal and the coal consumption per unit of length per year. The curve of the equation is shown in Fig. 1 for a single and double track road. For a given price of coal per ton one can immediately find the density of traffic, in terms of coal consumption necessary to justify electrification. For instance with coal at $5.00 per ton the traf-

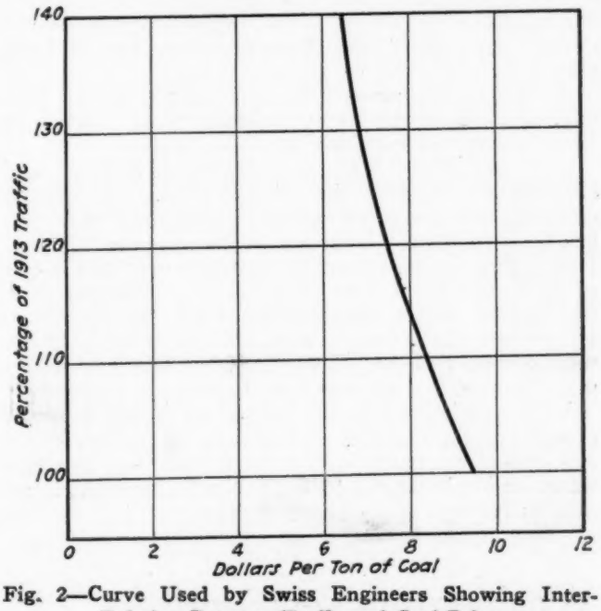



**Fig. 2—Curve Used by Swiss Engineers Showing Inter-Relation Between Traffic and Coal Price**

fic on a single track line must be dense enough to consume at least 600 tons of coal per mile per year.

TABLE No. 2

Analysis of Electrification Economies as Developed for the Swiss Railroads

| Item of expense. | Added cost per year | Saving per year | Source and remarks. |
|---|---|---|---|
| Maintenance and operation of power plant. | $325,000 | ..... | An average of $65,000 per plant. |
| Maintenance of transmission and distribution system. | $564,000 | ..... | An average of $580 per mile. |
| Maintenance and operation of substations. | $161,000 | ..... | An average of $7,000 per substation. |
| Purchase of miscellaneous power. | $120,000 | ..... | ..... |
| Engine crew expenses. | | $900,000 | Due to fact that 15,700,000 elec. loco. miles per year will haul traffic that 17,000,000 steam loco. miles used to. Also crews average 22,000 loco. miles per man per year on electrics as compared to 17,000 with steam loco. |
| Depot personnel. | | $244,000 | Due to fact that they require two-thirds the number of men with electrics as with steam. |
| Locomotive maintenance. | | $460,000 | Due to fact that it costs but 10.4¢ with electric compared to 12.3¢ with steam per loco. mile. |
| Saving in train crews. | | $200,000 | |
| Coal transportation, border to tender. | | $960,000 | Pay about an average of $1.82 per ton of coal for transporting from border to tender. |
| Miscellaneous oil, water, etc. | | $222,000 | |
| Interest, depreciation, and sinking fund on new equipment distribution system, power plant, etc. | $6,782,000 | | Interest rate 5 per cent. ....Sinking fund for 100 years .... Depreciation: for loco., 40 yrs.; trans. and distr. system, 50 yrs.; elec. part of power plant and subst., 50 years. |
| | $7,952,000 | $2,986,000 | |

The Swiss study is an example of a type that does not try to find what sections should be electrified, but rather

what the results of electrification of a given network of lines are under varying coal and traffic conditions. In view of the fact that this is not a general method but one applied specifically, it is easier to go into greater detail and the results are a good deal more accurate. This then is a method to be applied after the previous method has shown what sections should comprise the network to be electrified.

An analysis of the electric operation of the final 970-mile network of the Swiss Railroad to be finished by 1929 is shown in table No. 2.

The $4,966,000 difference between $7,952,000 and $2,986,000 represents the additional cost of electric operation over the steam operation after the cost of fuel has been subtracted from the steam expenses. Therefore if there is any saving in electric operation the cost of fuel must be at least equal to or greater than this $4,966,000. Since the assumed traffic used 530,000 tons of coal, the price of coal would have to be $9.38 per ton, to make this sum of $4,966,000. And it is at that price for coal that electrification becomes economical.

With a variation in traffic the various factors naturally change and the resultant difference to be equaled by the cost of coal varies and with it the price of coal at which electrification becomes justified. Fig. 2 shows the interrelation between traffic and coal price.

# Washington-New York Fast Run of June 11

THE special train which was run over the Pennsylvania Railroad from Washington to New York on Saturday, June 11, carrying motion picture reels of the Lindbergh reception, made a little better time than was stated in the first report (*Railway Age*, June 18, page 1974), the actual distance being 224½ miles; and from Holmesburg Junction, near Philadelphia, to South Street, Newark, 66.6 miles, the time was 47 minutes or at the rate of 85 miles an hour. No stop was made at Holmesburg Junction or at South Street.

The locomotive was an Atlantic type, class E6s, weighing in working order 243,600 lb. The diameter of the driving wheels is 80 in.; dimensions of cylinders 23½ in. by 26 in.; size of grate 72 in. by 110⅜ in.; tractive effort, 31,275 lb.

The weight of the cars, empty, was 209,600 (coach 122,000; baggage car 87,600).

The best previous record from Washington to New York (March 4, 1925) was bettered on this occasion by 33 minutes. The run most nearly like that of June 11, was one which was made by a special train of the Pennsylvania, carrying railroad officers to Chicago to attend the meeting of the American Railway Association on October 24, 1905. On this run, reported in the *Railroad Gazette* of November 17, 1905, a distance of 131.4 miles was traversed at 77.81 miles an hour and from Crestline, Ohio, to Clarke Junction, Ind., 257.4 miles, the rate of speed was 74.55 miles an hour. The locomotive in that case was also an Atlantic type, but it weighed only 176,600 lb. The train, however, weighed 520,000 lb., consisting of four cars.

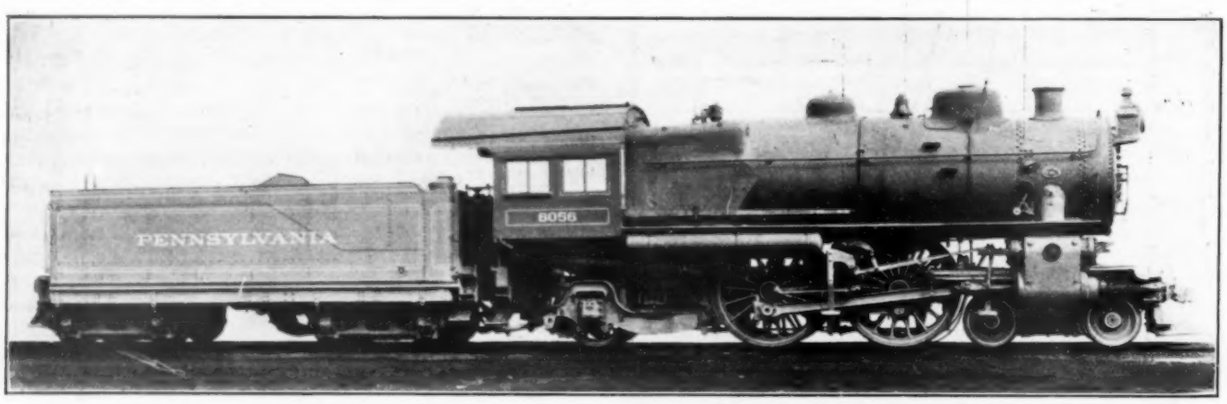
### Water Stop at Wilmington

On the run now reported, plans were made to run the steam locomotive through from Washington to Manhattan Transfer but it was necessary to stop at Wilmington, Del., to take water because, by reason of the high speed of the train, the scoop did not take up a sufficient quantity of water at the track tank south of Wilmington. The stop at Wilmington lasted four minutes. Even including this, however, the time from Washington to Manhattan Transfer, 216 miles, was 175 minutes, or at the rate of 74 miles an hour. Excluding the stop at Wilmington, the rate would be 75.78 miles an hour from start to stop.

The stop at Manhattan Transfer to change from steam to electric locomotive, took three minutes.

It will be seen that with both of these stops taken out —if one locomotive could be run through without stop from Washington to the Pennsylvania terminal in New York—the time between the two cities would be only three hours for the 224½ miles. The time actually taken (3 hr. 7 min.) makes the rate 72 m.p.h.

It is of interest to note that on the line of the Pennsylvania from Washington to New York, grade crossings of highways are comparatively few, and there are no municipal regulations limiting speed at any point. The only speed limits are those set by the company itself to insure safety on curves and to provide proper regulation as between trains of different classes.




**Atlantic Type Locomotive of the Pennsylvania (Class E 6 s)**

This is the type of locomotive that ran from Washington to Manhattan Transfer, 216 miles on June 11, in 2 hours, 55 minutes, drawing two cars.

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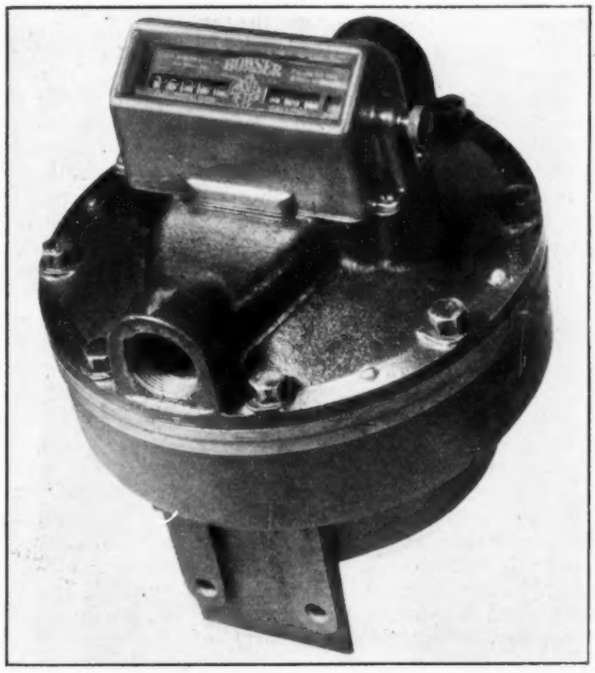
PRELIMINARY SURVEYS are being made on the Cartagena-Barranquilla Railway, Colombia. On May 19, 1927, a contract was entered into between Mr. de Castro as owner of both franchises and the Colombian Coastwise Railways, Inc., a Delaware corporation, to acquire the rights and privileges granted to Mr. de Castro. It is expected that construction will start late in this year.

# A Volumetric Meter for Oils

A METER for recording the flow of liquids through pipe lines, and which is especially adapted for oils, has been placed on the market by S. F. Bowser & Co., Inc., Ft. Wayne, Ind. The device, which is known as the Bowser Xacto meter, is constructed on the volumetric principle and is designed to be well within the tolerances prescribed by the Bureau of Standards.

In operation the oil flows into the meter and is measured in five vertical cylinders arranged in a circle. The pistons of the cylinders are attached to a revolving circular plate which tilts at various angles from the horizontal as it revolves, in such a way that each cylinder is completely filled and emptied in turn. It is said that the measurements are accurate, regardless of the rapidity of the flow of the oil. Continuous counters show the total number of gallons passing through the meter up to a certain volume and then repeat from zero, being arranged so that the record cannot be changed or tampered with except by taking the meter apart. On the right is



**The Bowser Xacto Meter**

a set-back recorder which can be turned back to zero at the beginning of any particular operation.

### Meters in Five Sizes

The meters are made in five sizes, for pipe lines varying from ¾ in. to 3 in. in diameter and range in capacity from 10 to 160 gal. per min., depending on the size of the pipe line. The largest meter has a totalizer recording up to 1,000,000 gal. before repeating and a set-back counter recording up to 10,000 gal., while the others have totalizers recording up to 100,000 gal. with set-back counters recording up to 1,000 gal.

The body of the meter is of cast iron and the inner mechanism may be of materials best suited for the liquid to be handled.

Since the meters will function for any kind of oil, ranging from fuel oil to gasoline, they may be used for manifold purposes in railway service, and a number of them are being installed in connection with power pumps and various accessories for the rapid fueling of gas-electric railway motor cars, one of these installations having been made recently on the Reading at Trenton, N. J.

# Railway Mileage of the World

THE total railway mileage of the world in 1924 was 757,834 miles of line, according to the compilation made by Archiv für Eisenbahnwesen, translated by the Bureau of Railway Economics.

Of the total, the mileage in the United States, 250,966, represented 33 per cent. The total world mileage shows an increase of over 7,000 miles between 1923 and 1924. For the latter year there were 1.6 miles of line for each 100 square miles of area and 4.2 miles for each 10,000 of population, while in the United States there were 6.9 miles per 100 square miles and 23.6 miles per 10,000 population. The table follows:

| Continent and country | Miles of line at end of year 1923 | Miles of line at end of year 1924 | Area (sq. miles) | Population (number) | Miles of line in 1924 per 100 sq. miles of area | Miles of line in 1924 per 10,000 population |
|---|---|---|---|---|---|---|
| **North America** | | | | | | |
| Antigua | ..... | 20 | 116 | 19,000 | 17.2 | 10.5 |
| Bahama Islands | *..... | 10 | 4,402 | 53,000 | 0.2 | 1.9 |
| Canada | 39,861 | 40,093 | 3,729,732 | 8,788,000 | 1.1 | 45.6 |
| Costa Rica | 667 | 667 | 23,012 | 498,000 | 2.9 | 13.4 |
| Cuba | 3,723 | 3,723 | 44,209 | 3,123,000 | 8.4 | 11.9 |
| Dominican Republic | 408 | 408 | 19,344 | 895,000 | 2.1 | 4.6 |
| Guatemala | 681 | 685 | 42,355 | 2,005,000 | 1.6 | 3.4 |
| Haiti | 173 | 173 | 11,081 | 2,045,000 | 1.6 | 0.8 |
| Honduras | 812 | 812 | 38,687 | 673,000 | 2.1 | 12.1 |
| Jamaica | 200 | 200 | 4,208 | 858,000 | 4.8 | 2.3 |
| Martinique | 185 | 186 | 386 | 244,000 | 48.2 | 7.6 |
| Mexico | 16,443 | 16,445 | 760,309 | 14,235,000 | 2.2 | 11.6 |
| Newfoundland | 953 | 953 | 162,934 | 263,000 | 0.6 | 36.2 |
| Nicaragua | 200 | 200 | 49,228 | 638,000 | 0.4 | 3.1 |
| Panama | 469 | 469 | 32,394 | 434,000 | 1.4 | 10.8 |
| Porto Rico | 340 | 340 | 3,436 | 1,365,000 | 9.9 | 2.5 |
| St. Kitts | *..... | 16 | 77 | 17,000 | 20.8 | 9.4 |
| Salvador | 256 | 256 | 13,166 | 1,582,000 | 1.9 | 1.6 |
| United States (incl. Alaska) | 251,158 | 250,966 | 3,625,099 | 106,139,000 | 6.9 | 23.6 |
| Virgin Islands | *..... | 30 | 77 | 5,000 | 39.0 | 60.0 |
| Total. North America | 316,529 | 316,652 | 8,564,252 | 143,879,000 | 3.7 | 22.0 |
| **South America** | | | | | | |
| Argentina | 23,156 | 23,482 | 1,153,128 | 9,548,000 | 2.0 | 24.6 |
| Barbados | 24 | 24 | 154 | 156,000 | 15.6 | 1.5 |
| Bolivia | 1,502 | 1,502 | 567,645 | 2,890,000 | 0.3 | 5.2 |
| Brazil | 18,704 | 18,704 | 3,280,890 | 30,636,000 | 0.6 | 6.1 |
| British Guiana | 104 | 104 | 89,498 | 298,000 | 0.1 | 3.5 |
| Chile | 5,050 | 5,382 | 289,807 | 3,755,000 | 1.9 | 14.3 |
| Columbia | 1,020 | 1,020 | 495,367 | 5,855,000 | 0.2 | 1.7 |
| Dutch Guiana | 37 | 37 | 54,324 | 111,000 | 0.1 | 3.3 |
| Ecuador | 652 | 652 | 118,533 | 2,000,000 | 0.6 | 3.3 |
| Paraguay | 309 | 309 | 171,815 | 1,000,000 | 0.2 | 3.1 |
| Peru | 2,075 | 2,075 | 532,201 | 5,550,000 | 0.4 | 3.7 |
| Trinidad | 173 | 173 | 1,969 | 366,000 | 8.8 | 4.7 |
| Uruguay | 1,653 | 1,659 | 72,162 | 1,603,000 | 2.3 | 10.3 |
| Venezuela | 660 | 660 | 393,977 | 2,491,000 | 0.2 | 2.6 |
| Total South America | 55,119 | 55,783 | 7,221,470 | 66,259,000 | 0.8 | 8.4 |
| **Africa** | | | | | | |
| Abyssinia | 495 | 495 | 46,332 | 65,000 | 1.1 | 76.2 |
| Algiers & Tunis | 4,220 | 4,220 | 270,502 | 7,896,000 | 1.6 | 5.3 |
| Angola | 818 | 818 | 484,865 | 4,182,000 | 0.2 | 2.0 |
| Bechuanaland | 425 | 425 | 275,058 | 153,000 | 0.2 | 27.8 |
| Belgian Congo Colony | 1,273 | 1,273 | 979,499 | 7,153,000 | 0.1 | 1.8 |
| British Central Africa (Nyasaland) | 174 | 174 | 39,962 | 1,202,000 | 0.4 | 1.4 |
| British East Africa (incl. Zanzibar) | †693 | 693 | 431,969 | 5,945,000 | 0.2 | 1.2 |
| Egypt (incl. Sudan) | 4,894 | 4,894 | 1,364,866 | 19,629,000 | 0.4 | 2.5 |
| Equatorial Africa | †336 | 336 | 871,004 | 2,851,000 | 0.04 | 1.2 |
| French West Africa | 1,714 | 1,714 | 356,564 | 2,475,000 | 0.5 | 6.9 |
| Gold Coast | 194 | 302 | 80,270 | 2,078,000 | 0.4 | 1.5 |
| Kamerun | 247 | 283 | 166,525 | 3,000,000 | 0.2 | 0.9 |
| Madagascar | 435 | 600 | 223,938 | 3,278,000 | 0.3 | 1.8 |
| Mauritius | 144 | 144 | 734 | 377,000 | 19.6 | 3.8 |
| Morocco | 885 | 885 | 162,162 | 5,480,000 | 0.5 | 1.6 |

| Continent and country | Miles of line at end of year 1923 | 1924 | Area (sq. miles) | Population (number) | Miles of line in 1924 per 100 sq. miles of area | per 10,000 population |
|---|---|---|---|---|---|---|
| Mozambique .. | 455 | 521 | 293,436 | 3,120,000 | 0.2 | 1.7 |
| Nigeria ..... | 1,126 | 1,126 | 336,178 | 18,750,000 | 0.3 | 0.6 |
| Reunion ..... | 79 | 79 | 927 | 173,000 | 8.5 | 4.6 |
| Rhodesia ..... | 2,457 | 2,470 | 440,000 | 1,883,000 | 0.6 | 13.1 |
| Sierra Leone.. | 338 | 355 | 24,904 | 1,541,000 | 1.4 | 2.3 |
| Southwest Africa | 1,414 | 1,680 | 322,433 | 228,000 | 0.5 | 73.7 |
| Tanganyika.... | 892 | 1,019 | 365,097 | 4,107,000 | 0.3 | 2.5 |
| Togoland .... | 204 | 206 | 20,077 | 670,000 | 1.0 | 3.1 |
| Union of South Africa ..... | 11,570 | 11,745 | 473,089 | 6,929,000 | 2.5 | 17.0 |
| Total, Africa. | †35,482 | 36,457 | 8,030,391 | 103,165,000 | 0.5 | 3.5 |
| Asia: | | | | | | |
| Asia Minor, Syria & Arab. (incl. Cyprus) | 3,829 | 3,829 | 1,418,225 | 21,311,000 | 0.3 | 1.8 |
| British East Indies ..... | †38,068 | 38,068 | 1,828,495 | 318,942,000 | 2.1 | 1.2 |
| Ceylon ..... | 733 | 733 | 25,328 | 4,505,000 | 2.9 | 1.6 |
| China ..... | 7,173 | 7,173 | 4,300,968 | 440,139,000 | 0.2 | 0.2 |
| Cochin China, Cambodia, Annam, Tonkin | 1,490 | 1,490 | 274,440 | 19,122,000 | 0.5 | 0.8 |
| Dutch East Indies (India Java & Sumatra) ..... | 1,894 | 1,895 | 733,668 | 49,351,000 | 0.3 | 0.4 |
| Japan (Incl. Korea, Formosa & Kuantung) .... | 13,110 | 13,110 | 265,135 | 77,728,000 | 4.9 | 1.7 |
| Malay States.. | 1,163 | 1,163 | 52,085 | 2,448,000 | 2.2 | 4.8 |
| North Borneo, Sarawak ... | *..... | 140 | 78,958 | 889,000 | 0.2 | 1.6 |
| Palestine ..... | 696 | 696 | 8,996 | 757,000 | 7.7 | 9.2 |
| Persia ..... | 351 | 350 | 628,186 | 10,000,000 | 0.1 | 0.4 |
| Philippines .... | 810 | 810 | 115,019 | 10,953,000 | 0.7 | 0.7 |
| Pondicherry ... | 59 | 59 | 116 | 172,000 | 50.9 | 3.4 |
| Portuguese India | 54 | 54 | 1,467 | 579,000 | 3.7 | 0.9 |
| Russia (Asiatic) | 7,084 | 10,184 | 6,362,822 | 97,857,000 | 0.2 | 1.0 |
| Siam ..... | 1,538 | 1,539 | 195,058 | 9,207,000 | 0.8 | 1.7 |
| Total—Asia. | †78,052 | 81,293 | 16,288,966 | 1,063,960,000 | 0.5 | 0.8 |
| Australia: | | | | | | |
| Canberra Federal District. | 5 | 5 | 927 | 2,572,000 | 0.5 | 0.02 |
| Hawaii (Incl. Mawi & Oahu) | 243 | 243 | 6,448 | 256,000 | 3.8 | 9.5 |
| New Caledonia. | *..... | 19 | 7,220 | 47,000 | 0.3 | 4.0 |
| New So. Wales | 5,477 | 5,654 | 309,460 | 2,100,000 | 1.8 | 26.9 |
| New Zealand .. | 3,029 | 3,084 | 104,749 | 1,219,000 | 2.9 | 25.3 |
| North Territory | 199 | 199 | 523,630 | 3,867,000 | 0 04 | 0 5 |
| Queensland ... | 7,067 | 7,067 | 670,502 | 756,000 | 1.1 | 93.5 |
| South Australia | 3,488 | 3,488 | 380,077 | 495 000 | 0 9 | 70.5 |
| Tasmania ..... | 873 | 873 | 26,216 | 214,000 | 3.3 | 40.8 |
| Victoria..... | 4,377 | 4,483 | 87,876 | 1,531.000 | 5 1 | 29.3 |
| West. Australia | 4,870 | 4,870 | 975,908 | 333,000 | 0.5 | 146.2 |
| Total—Australia | 29,628 | 29,985 | 3,093,013 | 13,390,000 | 1.0 | 22.4 |
| Europe: | | | | | | |
| Albania ..... | 186 | 186 | 14,517 | 877,000 | 1.3 | 2.1 |
| Austria ..... | 4,153 | 4,373 | 32,355 | 6,647,000 | 13.5 | 6.6 |
| Belgium ..... | 6,893 | 6,893 | 11,737 | 7,666,000 | 58.7 | 9.0 |
| Bulgaria ..... | 1,624 | 1,624 | 39,807 | 5,008,000 | 4.1 | 3.2 |
| Czecho-Slovakia | 8,718 | 8,718 | 54,209 | 13,613,000 | 16.1 | 6.4 |
| Denmark ..... | 3,086 | 3,096 | 16,602 | 3,381,000 | 18.6 | 9.2 |
| Esthonia ..... | 890 | 890 | 18,340 | 1,107,000 | 4.9 | 8.0 |
| Finland ..... | 2,728 | 2,821 | 150,000 | 3,365,000 | 1 9 | 8.4 |
| France ..... | 33,281 | 33,284 | 212,741 | 39,210,000 | 15 6 | 8.5 |
| Germany ..... | 35,817 | 36,028 | 182,240 | 59,853,000 | 19.8 | 6.0 |
| Great Britain.. | 24,396 | 24,396 | 94,981 | 44,517,000 | 25.7 | 5.5 |
| Greece ..... | 1,983 | 1,983 | 50,193 | 5,065,000 | 4.0 | 3.9 |
| Hungary ..... | 5,921 | 5,922 | 35,792 | 8,119,000 | 16.5 | 7.3 |
| Italy ..... | 12,840 | 12,840 | 119,653 | 38,756,000 | 10 | 3.3 |
| Jugo-Slavia ... | 5,699 | 5,699 | 96,139 | 12,017,000 | 5.9 | 4.7 |
| Latvia ..... | 1,755 | 1,755 | 25,405 | 1,596,000 | 6.9 | 11.0 |
| Lithuania .... | 1,939 | 1,939 | 21,351 | 2,035,000 | 9 1 | 9.5 |
| Luxemburg ... | 334 | 334 | 1,004 | 261,000 | 33.3 | 12.8 |
| Malta, Jersey, Man ..... | 68 | 68 | 425 | 375,000 | 16.0 | 1.8 |
| Netherlands... | 2,141 | 2,265 | 13,205 | 6,865,000 | 17.2 | 3.3 |
| Norway ..... | 2,148 | 2,147 | 125,019 | 2,650.000 | 1.7 | 8.1 |
| Poland ..... | 11,975 | 11,974 | 149,923 | 27.193,000 | 8.0 | 4.4 |
| Portugal ..... | 2,129 | 2,129 | 35,483 | 6,033,000 | 6.0 | 3.5 |
| Roumania .... | 7,323 | 7,322 | 113,900 | 16,500,000 | 6.4 | 4.4 |
| Russia (European) ..... | 35,027 | 35,708 | 1,444,402 | 67,336,000 | 2.5 | 5.3 |
| Spain ..... | 9,676 | 9,676 | 195,135 | 21,658,000 | 5.0 | 4.5 |
| Sweden ..... | 9,556 | 9,765 | 173,166 | 6,006,000 | 5.6 | 16.3 |
| Switzerland .. | 3,572 | 3,572 | 15,946 | 3,902,000 | 22.4 | 9.2 |
| Turkey ..... | 257 | 257 | 1,158 | 1,000,000 | 22.2 | 2.6 |
| Total—Europe | 236,115 | 237,664 | 3,444,828 | 412,611,000 | 6.9 | 5.8 |
| Recapitulation: | | | | | | |
| North America | 316,529 | 316,652 | 8,564,252 | 143,879,000 | 3.7 | 22.0 |
| South America | 55,119 | 55,783 | 7,221,470 | 66,259,000 | 0 8 | 8.4 |
| Africa ..... | †35,482 | 36,457 | 8,030,391 | 103,165,000 | 0 5 | 3.5 |
| Asia ..... | †78,052 | 81,293 | 16,288,966 | 1,063,960,000 | 0.5 | 0.8 |
| Australia .... | 29,628 | 29,985 | 3,093,013 | 13,390,000 | 1.0 | 22.4 |
| Europe ..... | 236,115 | 237,664 | 3,444,828 | 412,611,000 | 6.9 | 5.8 |
| Total—World | †750,925 | 757,834 | 46,642,920 | 1,803,264,000 | 1.6 | 4.2 |

* Not reported.
† Corrected figure.

*Not reported.
†Corrected figure.

# Transportation Men Talk Before Southern Colleges

By Robert S. Henry
Director Public Relations, Nashville, Chattanooga & St. Louis, Nashville, Tenn.

TRANSPORTATION questions as they appear to the men actually engaged in moving the business of the country were discussed this spring before the students of 14 leading southern colleges, as a result of a course of lectures made available to the colleges through the Southeast Shippers' Advisory Board. Nine railroad officers, two members of state commissions and four industrial traffic men, presented the course, giving a total of 27 addresses, some before the entire student body of the colleges, others of more limited application before students of economics and allied subjects.

Both instructors and students showed keen interest in this contribution to a better understanding of the business of railroad transportation and its effect on the economic structure of the country.

"Transportation and the Economic Development of the South," "What It Takes to Run a Train" (from an operating standpoint) and "The Relationship of the Industrial Traffic Manager to Traffic and Transportation Problems" were the subjects discussed most frequently. Other subjects treated were "Shippers' Co-operation in Preventing Transportation Shortages," "Opportunities for the College Man in Railroading," and "The Relation of Rail and Motor Transportation." There was naturally a wide variety of individual treatment in the presentation of each subject.

Addresses were delivered at the following colleges and universities: Alabama Polytechnic Institute, University of Alabama, Georgia School of Technology, University of Georgia, University of Florida, Louisiana State University, University of North Carolina, Davidson College (Davidson, N. C.), University of Tennessee, Vanderbilt University (Nashville, Tenn.), University of South Carolina, University of the South (Sewanee, Tenn.), Mercer University (Macon, Ga.), and Birmingham-Southern College (Birmingham, Ala.). Addresses were made by W. R. Cole, president, Louisville & Nashville; J. J. Pelley, president, Central of Georgia; J. B. Hill, president, Nashville, Chattanooga & St. Louis; A. R. Lawton, vice-president, Central of Georgia; J. A. Streyer, traffic manager, American Short Line Railroad Association; John L. Cobbs, Jr., director of public relations, Atlantic Coast Line; G. M. Crowson, assistant to vice-president, Illinois Central; F. R. Mays, general superintendent, Yazoo & Mississippi Valley; Robert S. Henry, director of public relations, Nashville, Chattanooga & St. Louis; R. E. Howe secretary, Southern Appalachian Coal Operators' Association, Knoxville, Tenn.; W. A. Gunn, traffic manager, Purina Mills, Nashville, Tenn.; A. J. Young, assistant traffic manager, International Agricultural Corporation, Atlanta, Ga.; E. M. Mohler, traffic manager, Birmingham Slag Company, Birmingham, Ala., Hon. R. Hudson Burr, former chairman of the Florida Railroad Commission; and Hon. Frank P. Morgan, member of the Alabama Public Service Commission.

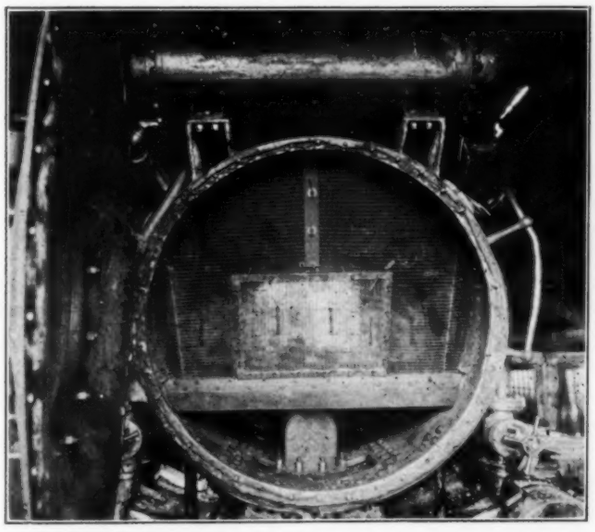
Arrangements for the course were made with both colleges and speakers by R. W. Edwards, district manager of the Car Service division, Birmingham, Ala. Similar talks will be made available by the railroad representatives to these and other colleges next year in accordance with the expressed wish of the college faculties.

# Smokebox Designed to Prevent Air Leaks

*Deflector plates and spark netting tongued and grooved to eliminate bolts—Front end a steel casting*

IN the locomotive smokebox in common use there are numerous openings that, if not properly closed, will eventually cause air leaks. Thus, if the saddle bolts, front door bolts, or any of the bolts that fasten auxiliary parts inside or outside of the smokebox, are not tight, or if the packing around the steam pipes where they pass into the smokebox is not tight, air leaks will occur. Going inside the smokebox, it is always a rather difficult job to remove the spark netting and deflector plates owing to the corroding effect of the smokebox gases on the bolts, nuts and keys required to hold the parts in place. The construction of the present smokebox also readily lends itself to air leaks owing to the fact that the gases quickly eat away the smokebox liner to which the cylinder saddle is fastened.

In an effort to eliminate air leaks, to reduce to a minimum the number of parts in the smokebox, to counteract as far as possible the effects of smokebox gases and to reduce the maintenance costs, W. L. Bean, mechanical manager, New York, New Haven & Hartford, has patented a smokebox which has been in service on locomotive No. 1,370 for a period of six months. The same design of front end has been included in ten

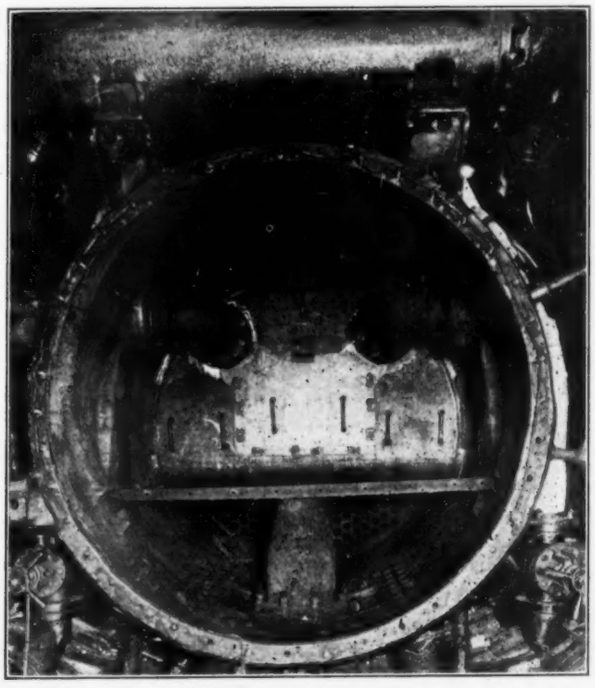


**Spark Netting in Place Ready to Close the Front Door which Swings on Hinges Cast Integral with the Smokebox**

Mountain Type locomotives now being built for the New Haven by the American Locomotive Company.

### The Design of the Smokebox

The smokebox is an integral steel casting, wherein are combined on the outside all auxiliary parts, such as steps, steam pipe flanges, feed water heater brackets, support for an outside throttle, smokebox brace lugs and Okadee front door hinges. The forward end of the smokebox casting is designed with a bullet nose form, the purpose of which is to remove the corner pocket for cinders, which often become incandescent due to .false drafts, thus eventually burning out the bottom of the front door. The extent to which this curvature of the smokebox is carried is dependent on the clearance required through the front end for the removal of the lower rows



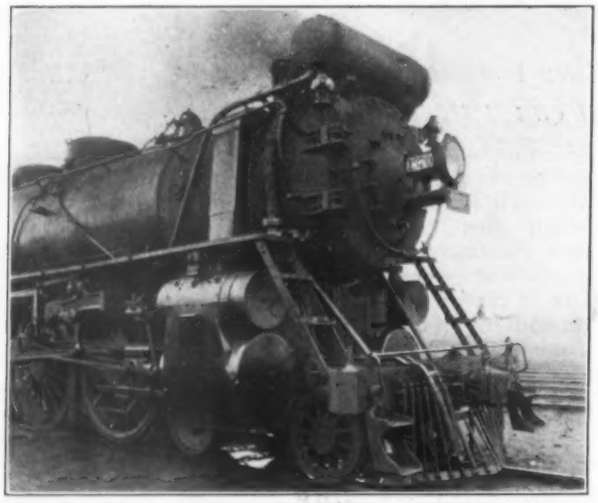
**The Inside of the Bean Smokebox Showing the Deflector Plates in Place and the Inside Steam Pipe Flanges Cast Integral with the Front End**

of superheater units and flues. Furthermore, the surface of the steel casting is more resistive to the abrasive action of the cinders, thus prolonging the life of the parts subjected to this wear.

### Curved Type Saddle Fit

As shown in the drawing, the saddle fit of the smokebox is designed to meet various conditions. Owing to the fact that locomotive No. 1,370 had already been built, the curved type of saddle fit had to be used, and the saddle bolts pass into the smokebox. When the smokebox is applied to new locomotives the bottom of the smokebox and the cylinder saddle will be cast flat and will be located a sufficient distance from the outside diameter of the smokebox so that the saddle bolts can be applied without entering the front end. This feature will eliminate the possibility of air leaks and leaky

steam pipes caused by loose saddle bolts. The saddle fit is cast with four lips that snugly fit the edges of the saddle, thus relieving the saddle bolts of some of the shearing action imposed on them. The flat saddle fit can be accurately machined, which cannot be done by the chipping method.



**A N. Y. N. H. & H. Pacific Type Locomotive Equipped with a Bean Smokebox**

### The Inside Construction

The superheater header pads, inside steampipe flanges, and deflector plate and spark netting grooves are cast integral with the inside of the smoke box. Of particular interest is the quick and secure manner in which the deflector plates and spark netting can be applied. First, the left and right upper vertical deflector plates are slid into the proper grooves. Next, the upper deflector plate door is slid in position which fits over four pins provided with slots to receive flat taper keys. Then the left and right side vertical deflector plates are fitted into the proper grooves. As shown in the drawing, with these paltes in position, an accurate fit is made around the top of the two steam pipes. Pieces of asbestos are placed in the grooves, formed in the deflector plates, thus making the flange fits spark tight. Next, the lower deflector door plate is locked in position by a design of pin shown at section *E-E*. The purpose of this design is to make the pin air tight.

### Locks Deflector Plates

With the lower door in position, the vertical deflector plates are securely locked in position. Next, the lower back horizontal deflector plate is placed in position, after which the front deflector plate is pushed in place.

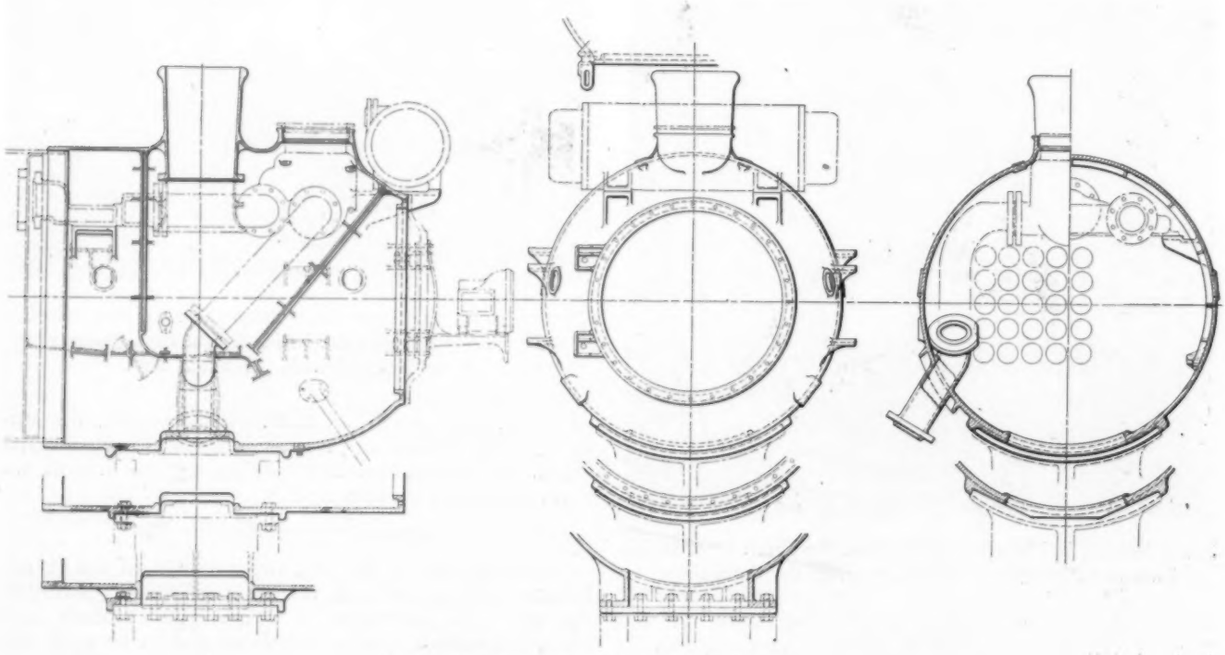
These two pieces form the lower plate or table. They are fastened under the exhaust nozzle by four bolts that support the nozzle.

### The Spark Netting

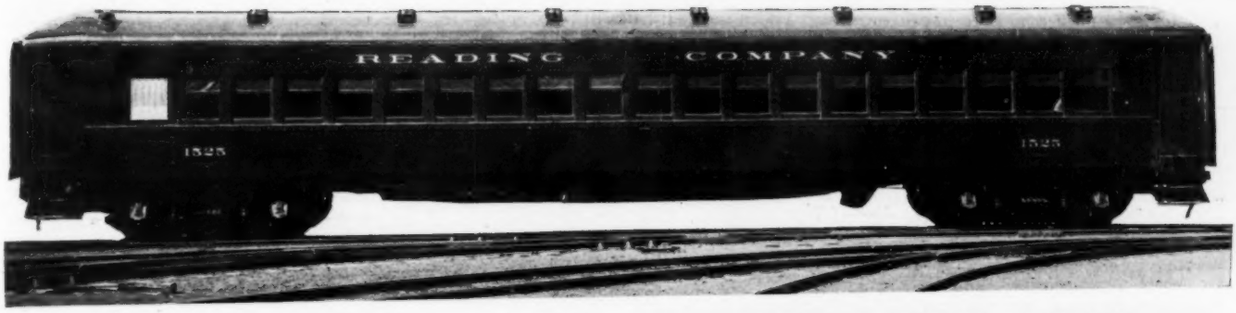
The front lower deflector plate is provided with a groove for receiving the spark netting and also with an adjustable damper plate. The netting is applied in somewhat the same manner as are the deflector plates. The left and right sections of the spark netting are pushed into the grooves after which the spark netting door is applied.

The bottom edge of the spark netting door is offset to slip into the groove located in the lower front horizontal deflector plate.

After six months' service on locomotive No. 1,370, there are no front end air leaks, which has effected a saving in fuel consumption; there has been a reduction in smokebox maintenance; and no burning of the front ends and door such as may be caused by a pocket of hot cinders.



**The Bean Cast Steel Smokebox**




*Passenger Car Built by the Bethlehem Steel Company for the Reading-C. of N. J. Hourly Service Between New York and Philadelphia*

# Reading Buys Special Passenger Equipment

## *For hourly train service between Philadelphia and New York via the C. of N. J. and the Reading*

NEW equipment was installed by the Reading the latter part of April for use in the hourly train service maintained jointly by the Reading and the Central Railroad of New Jersey between New York and Philadelphia, Pa. This equipment is of all-steel construction and was built especially for this service. All of the cars are finished outside with the Reading standard body color, the lacquer system of painting being used throughout. The inside finish is in four tones of gray, shaded from the lightest tone of gray on the deck down to the darkest tone at the base of the side walls. The gray tints are paneled and decorated in dark blue and gold striping, with additional white striping on the interior finish of the cafe cars. The hardware and light fixtures are finished in dull silver in harmony with the gray color of the walls and deck.

### The Club-Cafe Cars

The Club-cafe cars have a length over the body of 74 ft. and weigh 166,900 lb. The smoking room is 18 ft. 4 in. long and has a seating capacity for 14. It is furnished with mahogany arm chairs upholstered in blue-tone leather. The dining room of the cafe car is 26 ft. long and is arranged with four double and four single mahogany tables, seating a total of 24 persons. The chairs are upholstered in blue-tone leather similar to the chairs in the smoking room. The floor is of sanitary cement composition and is covered with Royal Wilton carpet with a gray ground and black figure. The carpet is laid over a hair-felt carpet lining to protect it from wear and also to make the floor easy for walking. The floor of the passageway and vestibules is covered with a square pattern of gray and blue tile. The window curtains are of pantasote, lined on the inside with blue silk mohair and trimmed at the bottom with gold-colored silk fringe. The toilet room is located between the end of the smoking room and the end of the car, and is provided with hot and cold running water and a flush hopper.

Lighting is secured from large center dome light fixtures, three of which are located in the smoking room and five in the dining room. In addition, there are six

**The Dining Room in One of the Club-Cafe Cars — The Kitchen of the Club-Cafe Cars**

double-light side brackets in the smoking room and eight double-light side brackets in the dining room. The globes used on these lights are of iridescent opal glassware. The hallway beside the kitchen is lighted with two small dome lights and the hallway to the toilet with one small dome light. The current for these lights is supplied by a 4-kw. body-hung lighting generator, which is driven from the truck axle, in combination with two storage batteries having a capacity of 750 amp. hr. Air circulation is provided for by means of four ceiling fans, two of which are located in the smoking room and two

**The Smoking Room of the Club-Cafe Cars Seats 14 Persons**

in the dining room between the center lights. These fans are motor-driven and are arranged so as to circulate the air without causing a draft. The kitchen and pantry are fitted with the latest sanitary equipment and includes two refrigerators and five ice boxes, for the care of perishable food; a steel range which is insulated to keep the kitchen and bulkheads cool; and two 110-gal. heavy copper water tanks which are located overhead. In addition, a 150-gal. water tank is carried under the car. Water for drinking purposes is carried in a separate tank having a capacity of 15 gal.

### The Passenger and Combination Cars

The passenger and combination cars have a length over the body of 63 ft. and a total seating capacity of 77 for the coaches and 50 for the combination passenger and baggage cars. Both of these types of cars weigh 116,400 lb. each. The passenger compartment of the combination car is 40 ft. long and the baggage compartment 22 ft. 2⅞ in. Two toilets are provided in the passenger cars, one at each end, which are separated from the main body of the car by a bulkhead designed to protect the passengers from drafts when the end doors are open. Each toilet is provided with a wash-stand, mirror and flush hopper. Both the passenger and combination cars are equipped with sanitary water coolers having white porcelain fronts. The water supply for the toilets is of the gravity type, the overhead tanks being equipped with filling nozzles located on both sides of the car.

The seats are of special construction designed to provide greater comfort for the passengers. They are equipped with double spring cushions. The backs of the seats are three inches higher than the passenger car seats of standard construction used by the Reading. The upholstering for the seats in the passenger cars is of blue Frizette plush and the seats in the combination car are upholstered in blue tone pantasote.

The floor of both the passenger and combination cars is of sanitary cement composition, dark gray in color with a blue and gray block pattern, rubber tile aisle strip through the center aisle. Light for these cars is furnished by eight electric center dome light fixtures with white globes, each fixture having a 100-watt lamp. Current for these lights is furnished from a 4-kw. body hung generator in connection with a storage battery having a capacity of 300 amp.-hr.

All the cars used in this service are equipped with the vapor system of steam heat. All the connections, pipes and control valves are located beneath the floor; only the control valve handles extend above the floor of the car. This type of installation was adopted to provide a cleaner floor and also to eliminate any possibility of passengers burning their shoes on the pipes leading to the radiators. The windows are fitted with polished plate glass with special pattern prismatic glass in the toilet. The vestibule doors are provided with wire glass to prevent danger from breakage. The window curtains of the passenger and combination cars are of pantasote, lined with blue silk mohair.

The trucks used under this equipment are of the equalized, lateral motion type, and are of cast steel construction. Clasp brakes are provided for all wheels.

### Parlor Cars Are Named for Famous Women

The parlor cars are named in honor of famous women, i.e., Abigail Adams, Louisa Alcott, Jane Austen, Clara Barton and Molly Pitcher. The walls and ceilings of these cars are finished in pearl gray and the deep-seated chairs are upholstered in apple green. Side fixtures are provided which furnish ample soft light for night reading.

*International*

**First Train to Pass Over Central Pacific When Transcontinental Line Was Completed in 1869**


*Eight-wheel Switcher Built for the Oliver Mining Company by the Lima Locomotive Works, Inc.*

# A New Switching Locomotive

## *Oliver Iron Mining Company gets highly developed unit with unusual features of design*

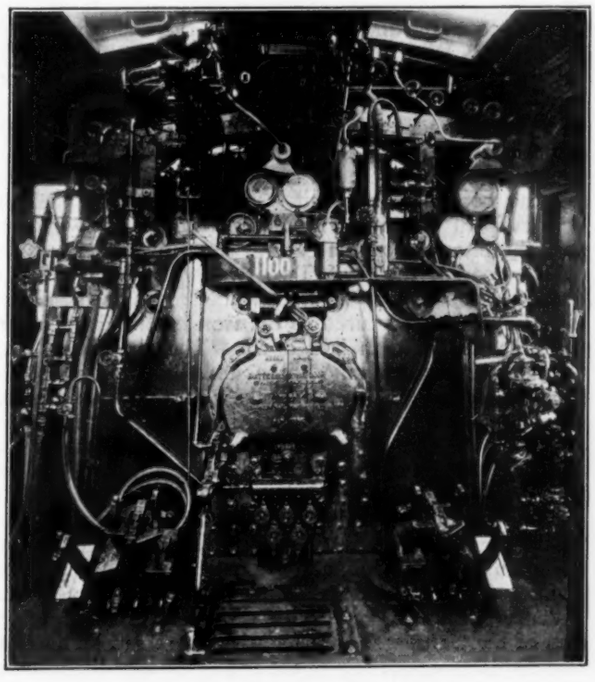
AN order of ten eight-wheel switching locomotives involving several unusual features of design and proportions has recently been delivered to the Oliver Mining Company by the Lima Locomotive Works, Inc. The features of special interest in these locomotives are the grate area of 63 sq. ft., which is relatively large for a locomotive of this type; the use of a limited maximum cut-off of 70 per cent; the application of a tender booster; the use of a stoker, and the inclusion in the equipment of the locomotives of a feedwater heater.

These locomotives, which are used in the operation of the open pit iron mines of the mining company, will operate on maximum grades of 1½ per cent. They have a total weight on drivers of 254,000 lb., which is an average of 63,500 lb. per pair of drivers. The locomotives develop a tractive force of 55,500 lb. at the maximum cut-off of 70 per cent, and to this is added the 14,000 lb. tractive force of the tender booster.

The boiler is of large capacity for a switching locomotive. It has a firebox with 63 sq. ft. of grate area and 230 sq. ft. of heating surface, including the arch

**Table of Dimensions, Weights and Proportions**

| | |
|---|---|
| Railroad | Oliver Iron Mining Co. |
| Type of locomotive | 8 wheel switcher |
| Service | Switching |
| Cylinders, diameter and stroke | 23 in. by 28 in. |
| Valve gear, type | Baker |
| Valves, piston type, size | 12 in. |
| Maximum travel | 8¾ in. |
| Steam lap | 2⅛ in. |
| Exhaust lap | ⅛ in. |
| Lead in full gear | ¼ in. |
| Cut-off in full gear, per cent | 70 |
| Weights in working order: | |
| On drivers | 254,000 lb. |
| Total engine | 254,000 lb. |
| Tender | 194,300 lb. |
| Wheel bases: | |
| Driving | 15 ft. |
| Total engine | 15 ft. |
| Total engine and tender | 56 ft. 10 in. |
| Wheels, diameter outside tires: | |
| Driving | 50 in. |
| Journals, diameter and length: | |
| Driving, main | 11 in. by 13 in. |
| Driving, others | 10 in. by 13 in. |
| Boiler: | |
| Type | Straight top |
| Steam pressure | 225 lb. |
| Fuel | Bit. |
| Diameter, first ring, inside | 80⅛ in. |
| Firebox, length and width | 108¾ in. by 84¼ in. |
| Arch tubes, number and diameter | 4—3 in. |
| Combustion chamber length | None |
| Tubes, number and diameter | 180—2¼ in. |
| Flues, number and diameter | 43—5½ in. |
| Length over tube sheets | 14 ft. |
| Grate area | 63 sq. ft. |
| Heating surfaces: | |
| Firebox and arch tubes | 230 sq. ft. |
| Tubes and flues | 2,334 sq. ft. |
| Total evaporative | 2,564 sq. ft. |
| Superheating | 680 sq. ft. |
| Comb. evaporative and superheating | 3,244 sq. ft. |
| Tender: | |
| Style | Water bottom |
| Water capacity | 10,000 gal. |
| Fuel capacity | 10 tons |
| General data estimated: | |
| Rater tractive force, 70 per cent | 55,500 lb. |
| Total tractive force, without booster | 69,500 lb. |
| Weight proportions: | |
| Weight on drivers ÷ total weight engine, per | 100 |
| Weight on drivers ÷ tractive force | 4.57 |
| Total weight engine ÷ comb. heat. surface | 74.18 |
| Boiler proportions: | |
| Tractive force ÷ comb. heat. surface | 16.21 |
| Tractive force × dia. drivers ÷ comb. heat. surface | 810.46 |
| Firebox heat. surface ÷ grate area | 3.65 |
| Firebox heat. surface, per cent of evap. heat. surface | 8.97 |
| Superheat. surface, per cent of evap. heat. surface | 26.52 |



**Interior of the Cab**

tubes. There is no combustion chamber. It is designed for a moderately high working pressure of 225 lb. The important boiler equipment includes the du Pont stoker, the Type A superheater with 43 units, and an Elesco feedwater heater. A Franklin power grate shaker is also included.

Another interesting feature in the construction of these locomotives is the use of cast steel cylinders of the Lima design, in which the exhaust steam is carried from the valve chamber to the faces of the saddle castings through detachable pipes. The locomotives are equipped with the American multiple front end throttle, and superheated steam for the auxiliaries is carried back to the left-hand turret from the main superheater header through a pipe along the left side of the boiler.

The frames are of vanadium cast steel, while the axles, rods and pins are of medium carbon steel, annealed.

These engines are equipped with two 8½-in. cross-compound pumps and these are located on the frames in front of the smokebox.

One of the illustrations shows the arrangement of the equipment on the back head in the cab. It will be seen that all turret valves have been neatly arranged and that each is plainly labelled.

The principal dimensions, weights and proportions are given in the table on page 153.

# Strapping Successful in Loading Sheet Iron*

DURING the last 12 months the American Rolling Mill Company has tried out the practice of strapping sheet iron into a unit pack when loading it in cars and has thereby brought about a decrease in damage due to water and a reduction in the disfiguration of the sheets. With this method sheets are held in a unit pack, which is free to move with relation to the car but in which the individual sheets are held stationary by longitudinal and transverse bands of 20-gage 8-in. galvanized iron bands drawn to a drum head tension and firmly fastened to wooden cushion pieces located on the top and bottom of the unit. In preparing the pack an 8-in. strip of galvanized iron sufficiently long to encompass the pile longitudinally with some overlap is placed on the floor of the car. Two two-by-four or one two-by-eight, wooden strips, of the same length as the sheets to be loaded, are secured to the iron band. Two transverse bands are then laid down. The sheets are then put in position and the three ends of the bands are brought around and over the pile with a wooden cushion strip 1 in. by 3 in. or 2 in. by 4 in., protecting the sides and ends of the sheets from actual contact with the bands. Wooden strips 2 in. by 4 in. or 2 in. by 8 in. are placed on the top of the pile as cushion strips and to provide a nailing surface for securing the bands. The transverse bands are first drawn tight under a tension of approximately 6,000 lb. and are nailed to the top cushion strips. The longitudinal band is then tightened and nailed, not only to the cushion strips but at the intersection of the transverse bands so that there can be no relative displacement of any of the bands. All of the wooden pieces are beveled or chamfered so that the unit will ride over any irregularities in the flooring and because it is impossible to tension the bands properly over square corners. The packs are placed about 18 inches from the ends of the car and about 6 inches from the side of the car.

Road tests so far made show no case in which there was a movement on the packs sufficient to bring them into contact with the ends of the car. The results of the initial tests, which were made on inter-plant shipments from Ashland, Ky., to Middletown, Ohio, were so satisfactory that this company has applied the method to material destined to customers. It has been used on cars consigned to a sufficiently large number of destinations to subject the shipments to all sorts of conditions.

This company is also making a number of trial shipments of sheet iron from its Ashland, Ky., plant, in which one pile of sheet iron in each car is completely wrapped with paper and seals in order to eliminate damage due to sweating or the condensation of moisture on the sheets. This method reduces condensation to the small amount of the moisture contained in the air within this envelope and its purpose is to determine whether the moisture found on the sheets is from a leaky roof or side, or whether it is due to the process of condensation. The test shipments consist of one sealed and three open packs in each car and it is thought that the data obtained will result in the adoption of this method for practically all shipments.

Bracing in cars has become an important subject and will continue to be, in view of the fact that the total production of rolled iron and sheet articles has increased from 17,000,000 gross tons in 1905 to 33,000,000 in 1925, while plates and sheets considered separately have increased 172 per cent for the same period. The Mechanical division of the American Railway Association has made a number of changes in the prescribed method of bracing sheets and plates in an effort to keep pace with changing conditions, but an intensive study of the problem indicates that the present methods are wrong in principle. According to impact registers, it is by no means unusual for cars to receive impacts as high as 20 miles per hour. In a car moving 10 miles per hour or 14.75 ft. per second, a pile of sheet iron weighing 10 tons would have a theoretical kinetic energy of 295,000 ft. lb. This thrust against the end bracing is reduced somewhat by friction, but, making full allowance for this factor, the force to be absorbed or dissipated is tremendous. The present method of bracing attempts to dissipate this energy instantly by preventing any movement of the pile relative to the car. The results are frequently disastrous. A few pieces of lumber 2 in. by 4 in. nailed to the side of the car are unequal to the task. If the bracing holds, the ends of the sheets are bent, and this leaves a space between the pile and the bracing at one end or the other. If further shocks are experienced, a hammering action replaces the original simple thrust and the consignee finds the sheets scattered over the car or the end of the car knocked out.

In 1922 the American Rolling Mill Company made some experimental shipments in which the sheets were bound together by the use of sheet bars and bolts. This method gave satisfactory results on the few cars tried, but was very expensive and materially increased the time required for loading and unloading. Since that time a Chicago producer has put in operation a system embodying the same principle, but which provides so much frictional engagement with the floor of the car that it practically allows no movement. Another producer has used wide longitudinal bands, but these bands are secured to the floor of the car and no movement of the pack is permitted. Under severe shock these bands frequently break or if they do not break it is usually found that the whole pile has become distorted and the ends of the top sheets have become injured.

*Abstract of a paper presented by F. E. Vigor, assistant freight traffic manager of the American Rolling Mill Company at the fourth annual claim prevention meeting of the Baltimore & Ohio at Cincinnati, Ohio, on March 23.

# Test Set for Communication and Signal Circuits

THE older and more cumbersome methods of testing for grounds, shorts and crosses on railroad communication, signal control and power circuits can now be replaced by a more modern portable instrument known as the West test set which is being manufactured by the American Electric Company, Inc., Chicago. The West test set is a combined lineman's portable testing device and telephone, designed for use in locating various faults associated with electrical circuits. It will rapidly detect such troubles as grounds, shorts, opens, crosses, high resistance joint, faulty lightning arresters, poor ground rods, swinging contacts, short circuited windings, tree grounds, leaky house wiring and faults in twisted pairs.

With this set it is possible for a lineman to locate trouble unaided. He can immediately determine the direction of the trouble without cutting wires or calling the test-board for information. The fundamental part of the set is a small finder coil which is conveniently hung on the line or clamped over an insulated wire. It is with this finder coil that a lineman can tell, upon turning the generator crank and listening in the receiver, the direction and approximate distance to the trouble. A battery is supplied for talking when desired. The tone is produced by a standard telephone condenser and a commutator spring on the generator which is timed to discharge the capacity peaks from the condenser out on the line at proper intervals. These capacity peaks are picked up by induction with the finder coil as they flow over the line to the trouble and back to the test set. Since a circuit can be completed only in the direction

**The West Test Set Ready for Service**

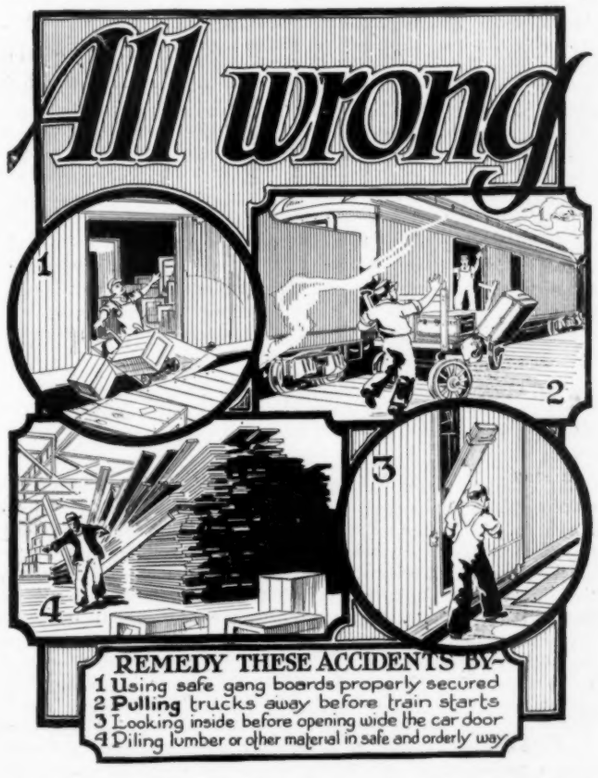
of the trouble, the finder coil will detect the tone only in that direction.

The practice of following the lines from pole to pole can be eliminated to a great extent as it is possible to locate trouble by testing at points a mile or more apart. The user of the set will observe a weaker tone on trouble far out and can soon learn to gage the distance to the trouble by the volume of the tone. It is also possible to locate trouble after dark since it is not necessary actually to follow the line.

The test set is compact, being 8 in. by 8 in. by 4¾ in. and weighing 9¾ lb. The case is made of a veneered wood covered with vulcanized fiber and finished with three coats of olive drab Duco.

# Safety Program for August

CIRCULAR No. 157, Safety Section, A. R. A., which has been issued by L. G. Bentley, chairman of the committee on education, is addressed mainly to freighthouse men, shop laborers and others who handle freight, material or supplies. Railroad employees




who come within the classes here referred to, have been injured more often, on the average, than have all employees taken together, judging by the records for the year 1925. For example, the number of injuries of common laborers in freight houses, grain elevators, etc., per million man-hours, was 129, whereas the average for all railway employees was less than 26. Baggage agents and assistants show an average of 43½. Truckers average 51.4, or double the average for all employees.

Few of the injuries to these classes, however, are fatal; but the committee believes that in view of the loss of time incurred by these men, the situation presents an opportunity for work in correcting wrong conditions.

The circular ends, however, by stating that the record of the men handling freight and supplies, in the year 1926, shows six killed and 10,026 injured, a reduction, as compared with 1923, of 33.3 per cent in killed and of 22.9 per cent in injured.

The poster issued in connection with this circular which is intended as the special lesson for the month of August, is here reproduced, reduced in size.

# Communications and Books

## More About Work Trains

NEW YORK, N. Y.

TO THE EDITOR:

Referring to the communication on page 28 of the issue of the *Railway Age* of July 2, 1927, entitled "Keeping the Work Train Busy."

This dispatcher advances views regarding saving that prevailed about twenty years ago, or just before the telephone was adopted for use in dispatching trains. Evidently, the dispatcher that wrote the communication does not have telephone train dispatching on his road, or, if he has, he does not get proper or efficient use from it. My own road and many others began to adopt the telephone for dispatching trains soon after the year 1907, at which time we provided telephones in boxes at waystations and at blind sidings between stations and portable telephones to work trains, wreckers, etc., so that the section foreman, extra gangs, work trains, wreck trains, etc., could get instant communication with the dispatcher and thereby eliminate delays and save time sufficient to warrant the entire expense of the telephone train dispatching system, including wire and equipment.

If this dispatcher will look into the telephone for dispatching, he will find most of the roads that have adopted it have accomplished everything he refers to as being done by telegraph without the expense of sending along an additional telegraph operator, as train crews, wreck masters, section foremen handle the matter direct with the train dispatcher in emergencies.

Operating Officer.

## The Three-Second Whistle Signal

BUFFALO, N. Y.

TO THE EDITOR:

Mr. Phillips of the Wabash appears to have been one of the chief speakers at the recent annual meeting of the Safety Section, A. R. A., at Chicago. The pamphlet containing the proceedings of the meeting, which has just been issued from the secretary's office, gives his speech to the extent of five pages; all to sustain the simple proposition that sounding the locomotive whistle all the way from the whistling post to the crossing, if made an invariable rule, would reduce the number of persons killed at highway crossings—which is evident to most people without much argument. Nothing is said in the proceedings about any discussion, so the reader remains in the dark as to what, if anything, was said for or against Mr. Phillips' plan; but it is time that the other side of this question received some attention. The superintendent who has to meet the complaints and criticisms of people annoyed by excessive noise and who is responsible for the steam wasted in unnecessary whistling ought to be considered. A slow freight takes sixty seconds to pass from the whistling post to the crossing; to sound the whistle even one half that length of time is an outrage, unless such a blast (or series of blasts) is absolutey needed, and it is not.

The only reasonable course in regard to the whistle rule is to leave the whistling to the judgment of the engineman. Modify the rule (if necessary) so as not to limit him to sounding the signal only once, and then tell him to watch the crossing to the best of his ability and repeat the two-long-two-short as many times as may be necessary. Each repetition of the four blasts takes three seconds. Sounding the signal twice is in most cases sufficient. Sounding it three times is ample, everywhere, unless the speed of the train is very low. With few exceptions it will be found that at a large portion of the crossings encountered by an engineman on a hundred-mile run, there is not an automobile anywhere in sight, and the whistle signal is a nuisance; a necessary evil. Specific laws must be complied with, of course; but having done that let us return to simple common sense.

It is a waste of energy to try to formulate a rule which shall wholly relieve the engineman from exercising his own discretion. He has to use his judgment a hundred times in the course of a run; at crossings, for example, at which an attendant is on guard, and on occasions where low speed makes whistling unnecessary.

It is the duty of every superintendent to operate his railroad noiselessly, so far as possible; and this is possible in many situations where we lazily assume that it is impossible.

G. S.

## Railroads Use Many Cedar Poles

CHICAGO.

TO THE EDITOR:

Your editorial, "The Permanence of Pole Lines," in the June 25 issue of the *Railway Age* suggests an interpretation to which we must take exception. If it was your intention in the construction of that editorial to deliberately avoid its application to western red cedar poles, it would have been best to specifically exempt that product from the inferences seemingly intended to be drawn from your remarks.

Neither the increase in prices of wooden poles nor the assumed lack of their durability have been the direct cause for the alleged substitution of "more permanent construction"; in fact, it is most difficult to find so-called "permanent construction" which is more economical per year of service than well treated wooden poles and, particularly, well butt-treated western red cedar poles. The dissatisfaction evidently felt by some of the railroad systems with wooden poles and, more especially, the oft-repeated references to untreated wooden poles, lies in the negligence of the railroads themselves to properly protect the poles they have used in the past against premature deterioration by decay; likewise, in the lack of proper design and application of engineering principles to the construction of pole lines on the railroads' right-of-ways. Numerous alleged failures were due, solely, to poles which were too small in the first place; that is, which had a factor of safety of little over unity and, being untreated, depreciated to such an extent in ground line circumference that at the time of failure they retained less than half of their initial strength after from 11 to 25 years' service. Correct design and proper protection against premature decay assure practical and economical permanence, and, most certainly, would prevent a repetition of the difficulties which the railroads claim to have had with wooden poles.

We may make a point for this case in the recently published statistics by the United States Department of Commerce covering the poles purchased in 1925. Therein we find that the railroads consumed 220,636 poles, or 6.7 per cent of the total consumption for that year, amounting to 3,281,514 poles. The railroads are shown to have purchased 73 per cent untreated poles, distributed as follows:

**Consumption of Poles During the Year of 1925 by Steam Railroads**

| Species | Per Cent Total | Per Cent Treated | Per Cent Untreated |
|---|---|---|---|
| Western red cedar | 14.5 | 21.7 | 78.3 |
| Northern white cedar | 8.1 | 20.1 | 79.9 |
| Southern white cedar | 0.8 | ... | 100.0 |
| Southern red cedar | 0.6 | ... | 100.0 |
| Chestnut | 22.2 | 1.5 | 98.5 |
| Pine | 43.1 | 44.5 | 55.5 |
| Cypress | 3.2 | ... | 100.0 |
| Douglas Fir | 4.5 | 59.0 | 41.0 |
| All others | 3.0 | ... | 100.0 |

From the foregoing one may judge that the Douglas fir and pine poles reported as purchased untreated were subsequently treated by the railroads at their own treating plants. Also, it is probable that a larger percentage of cedar poles were similarly treated by the railroads; thus, we probably would find, if these data were more accurately carried out, that the total of untreated poles consumed by the railroads would not exceed 40 per cent. Even that is far too large a percentage for an industry which has benefited so extensively from the employment of preservative treatments and it certainly is too large a percentage

to justify a criticism of the permanency of the type of pole lines used in the past when the shortness of life that may have developed was entirely due to the lack of the application of proper economies and the available remedial measures that have demonstrated their efficiency in connection with the use of treated cross ties.

KURT C. BARTH,
*Director Research Division, Western Red Cedar Association.*

# New Books

*Manual of the Endurance of Metals Under Repeated Stress. By H. F. Moore, research professor of engineering materials, University of Illinois. 5 in. by 7½ in. 63 pages. Bound in cloth. Published by Engineering Foundation.*

In spite of all that has been said or written about the failure of metals under repeated load, most people still speak of breaks as resulting from "crystallization." The less objectionable term, "fatigue of metals," is gaining favor but Dr. Moore shows that this term is only less accurate than that of crystallization which was shown to be incorrect 30 years ago. In view of this popular misunderstanding of what causes metal members to fail under repeated loads, this little book meets a well-defined need, for it presents a brief outline of the present knowledge on the subject as it has been evolved from investigations here and abroad. The treatment employs a minimum of technical knowledge and should prove of definite value to the man who desires a general knowledge of the subject and has neither the inclination nor the educational equipment for an exhaustive study.

# Books and Articles of Special Interest to Railroaders

*(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)*

## Books and Pamphlets

*Grade Crossings—List of References to Material Published* 1914, *March*, 1927, 56 p. Issued by Library, Bureau of Railway Economics, Washington, D. C. Apply.

*R. A. O. A. Overcharge and Agency Relief Claim Rules*, 1928 *Edition. Effective* July 10, 1927. 72 p. Pub. by Railway Accounting Officers Association, Washington, D. C., 50 cents.

*Stabilizing Business.* Papers and addresses by W. C. Mitchell, Paul H. Douglas, Stuart Chase, Benjamin Anderson, Jr., and others at the semi-annual meeting of the Academy of Political Science on various aspects of the stabilization problem. 152 p. Pub. by Academy of Political Science, Columbia University, New York City, $1.00.

*Packing for Domestic Shipment*, by Transportation Division, Bureau of Foreign and Domestic Commerce. Domestic Commerce Series Nos. 10-16. Fiber Containers, Cleated Plywood Boxes, Wirebound Boxes, Cooperage and Steel Barrels, Wooden Boxes, Nailed Wooden Crates, Baling. Pub. by Government Printing Office, Washington, D. C.

*The Railroad Accountant.* An Address by N. H. Loomis, before the 39th annual meeting of the Railway Accounting Officers' Association, June 8, 1927. 11 p. Pub. by Railway Accounting Officers' Association, Washington, D. C.

## Periodical Articles

*Dry Ice Makes a Bid for Markets*, by Harrison E. Howe. The "latest" in refrigeration, carbon dioxide, which is being tested in transportation of perishables. Nation's Business, July, 1927, p. 28-29.

*The Locomotives of the Nashville, Chattanooga & St. Louis Railway*, by Paul T. Warner. Preceded by a brief description of the railway, the history of the motive-power is given from the first locomotive of Christmas Day, 1850, to the present. Illustrated. Baldwin Locomotives, July, 1927, p. 3-22.

*"From Train to Rail, Evolution of the Roadbed of the P. R. R.,"* by W. B. Carter. A popular account of the history of the types of rail. The Mutual Magazine, July, 1927, p. 5-12, 58.

*Frenzied Railroad Finance*, by Marshall Lynn. Discussion of Van Sweringen brothers and Chesapeake & Ohio merger. Nation, July 13, 1927. p. 35-37.

# *Looking Backward*

## Fifty Years Ago

The war between the St. Louis, Iron Mountain & Southern [now part of the Missouri Pacific], and the Memphis & Little Rock [now part of the Chicago, Rock Island & Pacific], has resulted in a reduction of the passenger rate between Little Rock and Louisville to $2. The distance is 512 miles, making the rate about four-tenths of a cent per mile.—*Railway Age*, July 26, 1877.

Three equipment manufacturers have developed a system of continuous brakes for freight trains. The connection is made by rods running under the body of the car. A test has been made on the Missouri River, Ft. Scott & Gulf [now part of the St. Louis-San Francisco], where a train running at 35 miles an hour was uncoupled from the locomotive and the cars were stopped in 380 ft.—*Chicago Railway Review*, July 21, 1877.

The general strike now prevailing among trainmen has stopped freight trains, passenger trains and all traffic except mail trains on all roads but those that have compromised with their employees or have rescinded the order for a general reduction in wages. Terrorism has characterized the strike in large cities. The Pennsylvania has lost millions of dollars worth of property by incendiarism at Pittsburgh, track has been torn up on the Erie and a bridge was burned at Reading on the Philadelphia & Reading.—*Railway Age*, July 26. 1877.

## Twenty-Five Years Ago

Iowa has undertaken the difficult task of requiring the railways operating in that state to differentiate in a monthly report between earnings in the state and out of it.—*Railway Age*, July 25, 1902.

Nothing in recent finance has attracted more attention than the project of the Union Pacific for funding the floating debt incurred in the purchase of half of the capital stock of the Northern Pacific by issuing $31,000,000 of Oregon Short Line collateral trust gold bonds, which have as collateral 10 shares of the stock of the Northern Securities Company for each $1,000 of bonds—a company whose existence is threatened in the pending litigation in the courts.—*Railway Age*, July 25, 1902.

The board of aldermen of New York City has rejected the tunnel franchise for the proposed Pennsylvania terminal scheme in that city. The franchise has been approved by the Rapid Transit Commission and the action of the board was in accordance with the report of the committee on railroads. According to the city controller the railroad must renew its application, if it still desires to go ahead with its project, on terms likely to be accepted by the board of aldermen.—*Railway and Engineering Review*, July 26, 1902.

## Ten Years Ago

The Mobile & Ohio has taken off its dining cars, and the schedules of through trains are now so arranged that passengers can eat at stations.—*Railway Age Gazette*, July 20, 1917.

Statistics recently made public indicate that up to the present time in the efforts to conserve fuel and man power the railways have taken off passenger trains which are effecting a saving equivalent to about 18,500,000 passenger-train-miles a year.—*Railway Age Gazette*, July 20, 1917.

The United States government has ordered for service in France 300 80-ton Consolidation locomotives. It appears that the railways that have not locomotives now on order will have difficulty in obtaining delivery due to the influx of this order and Russian and British orders.—*Railway Age Gazette*, July 20, 1917.

# *Odds and Ends of Railroading*

Two ladies sitting in a railway carriage fell into a dispute concerning the window and called upon the guard to act as referee. "If the window is open," declared one, "I shall catch cold and die."

"If the window is shut," said the other, "I shall suffocate." A man occupying the corner seat here interposed. "First open the window, guard. That will kill one. Next shut it, that will kill the other. Then we can all go to sleep."—NEW ZEALAND RAILWAYS MAGAZINE.

No one, we suppose, has ever tried to enumerate the various commodities lost on trains—or rather left behind for employees to deliver to the lost and found bureaus. Some of these articles, however, are enumerated in the July issue of the Pennsylvania Mutual Magazine. Among them a set of false teeth and an eye (glass, we are glad to say). The most unusual, however, was a pair of crutches. The finding of these, says the Mutual Magazine, caused a lot of interest until the mystery was solved. Just what the solution was, however, we are not told.

The defunct Chicago, Peoria & St. Louis is now being operated piecemeal by various local companies. One of these sections of railroad, south of Springfield, Ill., is run by farmers and townspeople living along the right-of-way. They have kept it going by various expedients and, on the whole, do fairly well, but occasionally a mistake is made. For instance, not long ago a train arrived at a junction point, the crew lost the way and ran the train for more than 40 miles over the tracks of an entirely different railroad. The dispatcher of that line finally caught the wandering train at Jacksonville, Ill., and, by close attention, managed to get it headed in the right direction and back to its own rails. In the meantime, as might be imagined, the passengers were growing impatient and had to be fed, as all this took some time. There was one deaf old lady on the train. There nearly always is in such cases. She had a terrible time trying to find out what was happening. Eventually, when the passengers were fed, she ordered only toast and tea. Later, when she discovered that the railway was paying for it, she wanted the train to turn back so that she might order roast chicken and French pastry, but enough time had been lost and the crew refused to accede to her demands.

## The Kangaroo Tank

A car on a Missouri-Kansas-Texas freight train recently performed an unusual stunt when it took to the tracks of its own accord after having been derailed. The accident was caused by a brake beam which came down, and the car bumped along for about 400 yards, hit the frog at the Missouri Pacific crossing, and hopped on the tracks again.

The crew did not know of the accident until the train reached South Coffeyville, Kan., where it was signaled to stop. Employees of a manufacturing plant who saw the derailment had telephoned the yardmaster. A number of ties were badly damaged by the wheels, but that was the only damage done, probably because the car, which was a tank car, was empty.

## Column Conductor Animadverts on the Train Conductor

Richard Atwater, the columnist for the Chicago Evening Post, appears to be receiving a liberal education in modern railroading, judging from the following comment in his column:

Noting the other day that we heard a conductor venting his irritation rather loudly against a passenger so stupid as to have got on the wrong train we were driven to the philosophic conclusion that: "Mankind in the aggregate is a sheepish lot, and those whose task it is to deal with the human race in large herds deserve considerable sympathy." Imagine our consternation at receiving the following letter from an employee of the C. B. & Q. a couple of days later:

"If the incident occurred in your personal experience, or is otherwise well authenticated, you owe it to the traveling public and as a matter of justice to the railroads to inform the general manager of the line unfortunate enough to have a discourteous conductor in its employ just when and on what train the offense was committed.

"Despite constant efforts of railroad management it remains one of the most difficult things to get men to obey instructions. Even if our own is the road involved we would consider it a favor to be supplied the date needed for identification and further impression of this offender."

We hasten to say "Thank Q" to our courteous correspondent and assure him the incident did not take place on his road. It is, however, reassuring to learn that the sort of conduct mentioned is not generally endorsed by railroad managers; and we are glad we did not also mention that other recent experiences in crowded suburban traffic included having a door slammed in our face when we were about to disembark, resulting in our having a free ride to a more distant station, and having a hasty gateman take two punches out of us instead of one, resulting in a debate which concluded with us being out one ride.

We had actually begun to wonder if the local railroads had imported a few hundred trainmen from the New York subway system, and how many days it would be before we were kicked into our car by a zealous and official knee. Luckily, we were wrong in our suspicion, and are buying a dozen American beauty roses at once to distribute among our ticket-taking colleagues on our apologetic way home tonight.

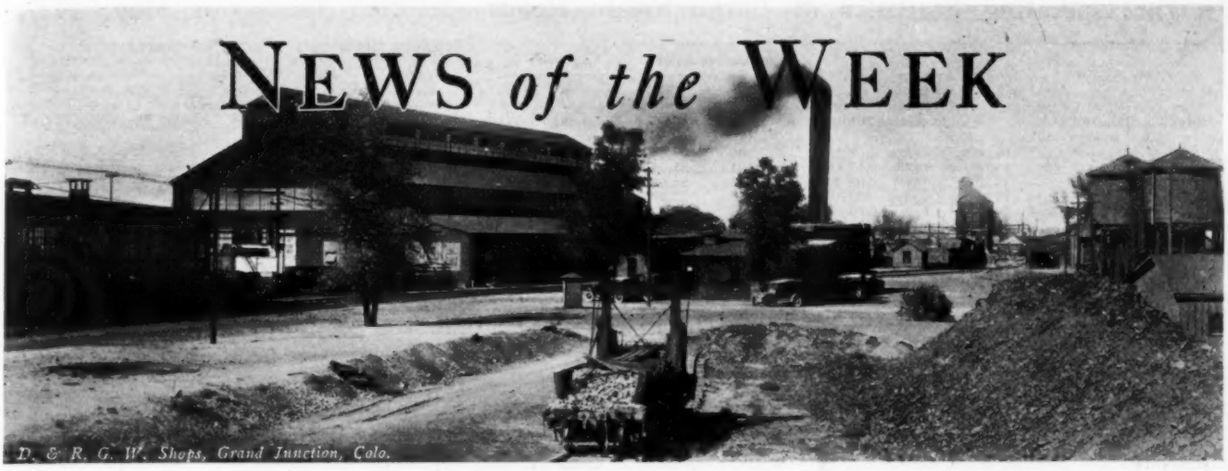
## Marooned Two Months by Flood

The Columbus & Greenville had a train marooned when the levee broke at Stop's Landing, Miss., just north of the main line. This train, which was a double-header, with 36 loaded cars containing cotton, linters, cottonseed products, lumber, sorghum seed, peas, and miscellaneous merchandise, was the last train to leave Greenville, Miss., on the Columbus & Greenville, about 12.15 a. m., April 21, 1927, after several thousand refugees and their effects had been moved out. At the time the train left Greenville, no water was in sight from the break in the Mississippi levee at Stop's Landing, 15 miles north of the city. The track was dry and the train was running at a speed of about 20 miles an hour. Upon approaching a large drainage ditch about one and three-fourths miles east of the protection levee of Greenville, the train crew saw the water coming in a wave

**The Marooned Train on the Columbus & Greenville**

two or three feet high. The train was stopped and the locomotives uncoupled and run across the trestle over the drainage ditch. In a few moments the water had risen over the track a sufficient height to put out the fires in the fire boxes of the two engines, and the train was thus marooned. The crew climbed into trees along the right-of-way and to the roof of a house near the track. They were rescued late on the afternoon of the following day by motor boat. There were no fatalities. This marooned train was the means of saving several lives. A public highway parallels the railroad on the north side at this point and several automobiles and trucks were caught by the flood on this highway, and their occupants washed down against the side of the track, where they climbed on top of the box cars, being rescued the next day. The train remained at this place for more than two months before it could be moved.

# NEWS *of the* WEEK



*D. & R. G. W. Shops, Grand Junction, Colo.*

CHARLES W. SIMPSON, recently elected as a member of the governing board of the Brotherhood of Locomotive Engineers and a member of the board of directors of the Brotherhood Bank of Cleveland, died on July 16 at Cleveland, O., while attending the Brotherhood convention.

## B. of L. E. Convention Continues

William B. Prenter, former president of the Brotherhood of Locomotive Engineers, has been barred by the triennial meeting of the organization from holding office pending the convening of the next meeting, three years hence. Three other deposed officers of the brotherhood, who were associated with Mr. Prenter in the management of the industrial and financial activities of the union, were found guilty of "laxity, carelessness and indifference" in the conduct of their affairs and were barred indefinitely from office-holding. Mr. Prenter's health did not permit his attendance at the meeting for discussion of complaints about his conduct of his office.

Mortgaging the office buildings of the brotherhood for $4,000,000, as a means of obtaining liquid capital for the organization's fiduciary enterprises, is reported to have been proposed at the convention.

## Oxy-Acetylene Distribution System at New Reading Car Shop

Certain misstatements were made about the oxy-acetylene distribution system in the new car repair shop of the Reading at Reading, Pa., as described in the June 25 issue of the *Railway Age* on pages 1989-1994. The system as installed consists of only two pipe lines instead of three, these lines varying in size with the distance from the generating plant, the larger carrying acetylene while the smaller carries oxygen. At the generating plant in connection with this system, acetylene alone is generated, the oxygen being manifolded to the distribution line from cylinders charged at the plants of the Linde Air Products Company, New York. Both the generating plant and the distribution system were installed by the Oxweld Railroad Service Company, Chicago, instead of the Oxweld Acetylene Company, as stated.

## Poor Service Threat in Soliciting Advertising

The Committee on Public Relations of the Eastern Railroads has issued the following statement with reference to advertising solicitation in employees' organization publications:

"We have just been advised of a current practice of soliciting advertising or contributions for railway employees' publications with the intimation that—unless the advertising is given or the contribution is made—railroad service to the shipper will be impaired or his shipments not be properly handled.

"There are a number of publications issued by responsible organizations of railway employees in which advertising space is sold. Railway executives have no criticism of legitimate solicitation of advertising for these publications. Whether or not the shipper should purchase such advertising is a question for the shipper to decide upon the merits as related to his particular business.

"But the shipper should thoroughly understand, that, while railway executives do not oppose such legitimate solicitation, they are unequivocally opposed to any solicitor intimating that railroad service will be affected by the shipper's decision as to advertising or contribution. Each shipper can decide such questions in the confidence that he will receive the best possible service, whatever his decision may be."

## B. & M. Reorganizes Mechanical Engineer's Department

Consistent with its general policy of reorganization in the mechanical department, the Boston & Maine has, under the direction of C. E. Barba, mechanical engineer, reorganized the department of the mechanical engineer. The department has been divided into three sections as follows:

OFFICE OF MECHANICAL ENGINEER

C. E. Barba.....Mechanical engineer
S. J. Raltz.....Assistant mechanical engineer
W. B. Mochrie.....Office engineer
G. F. Stevens....Assistant engineer in charge of locomotive design
E. W. Peterson....Assistant engineer in charge of car design
J. W. Pearley.....Assistant engineer in charge of shop machinery tools, jigs and fixtures

OFFICE OF ELECTRICAL ENGINEER

L. C. Winship.....Electrical engineer
E. K. Bloss.....Assistant electrical engineer
P. J. Callahan....Supervisor of train lighting

OFFICE OF TEST DEPARTMENT

C. B. Smith.....Engineer of tests
S. B. Dyer.....Assistant engineer of tests
J. J. Callahan.....Chief chemist

This reorganization has several objectives. Better co-ordination of work will be attained as the three departments are headed by the mechanical engineer, who will be in a position to direct the activities of the departments which was not possible prior to the reorganization. The men listed are now all located at the principal locomotive repair shops of the B. & M. at Billerica, Mass., and not scattered at various points on the system. A modern well equipped testing laboratory will be located at Billerica. A 200,000-lb. testing machine has been installed and much more equipment is to be added in the near future.

A mathematical expert has been included on the staff, who will make all the calculations required for the design of cars and locomotives, except those involved in boiler design, which will be made by a boiler supervisor who will be responsible for all the locomotive boilers on the system.

The new offices have been equipped with modern filing systems for correspondence, drawing and reports. A system has been worked out whereby each draftsman will have only one drawing at a time at his board.

## Capital Expenditures in First Quarter of 1927

Capital expenditures by railroads for new equipment and additions and betterments to property used in connection with transportation service amounted to $155,022,000 in the first three months of 1927, according to special reports filed by the Class I roads with the Bureau of Railway Economics.

Compared with the corresponding period last year, this represented a decrease of $10,678,000, while it also was a decrease of $14,278,000 under the corresponding period in 1925. Total capital authoriza-

(*Continued on page* 162)

# Freight Operating Statistics of Large Steam Roads—Selected Items for May, 1927,

| Region, road and year | Average miles of road operated | Train-miles | Locomotive-miles: Principal and helper | Locomotive-miles: Light | Car-miles: Loaded (thousands) | Car-miles: Per cent loaded | Ton-miles (thousands): Gross, Excluding locomotive and tender | Ton-miles (thousands): Net, Revenue and non-revenue | Average number of locomotives on line daily: Serviceable | Unserviceable | Per cent unserviceable | Stored |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New England Region: | | | | | | | | | | | | |
| Boston & Albany....1927 | 407 | 208,159 | 222,389 | 23,067 | 5,385 | 67.0 | 278,994 | 104,093 | 107 | 18 | 14.7 | 5 |
| 1926 | 407 | 243,461 | 260,401 | 27,656 | 5,649 | 67.8 | 289,406 | 110,085 | 128 | 13 | 9.3 | 17 |
| Boston & Maine....1927 | 2,085 | 508,272 | 581,003 | 56,084 | 13,218 | 70.1 | 673,762 | 271,892 | 280 | 71 | 20.1 | 29 |
| 1926 | 2,250 | 501,490 | 590,527 | 57,906 | 13,849 | 71.5 | 685,375 | 279,124 | 340 | 82 | 19.5 | 41 |
| N. Y., New H. & Hartf..1927 | 2,140 | 589,847 | 629,808 | 39,428 | 16,716 | 67.6 | 881,993 | 360,291 | 322 | 61 | 16.0 | 33 |
| 1926 | 2,163 | 574,705 | 611,105 | 40,669 | 16,887 | 68.3 | 885,278 | 370,498 | 314 | 52 | 14.3 | 21 |
| Great Lakes Region: | | | | | | | | | | | | |
| Delaware & Hudson....1927 | 875 | 362,972 | 489,634 | 53,845 | 10,538 | 62.4 | 682,659 | 331,609 | 246 | 35 | 12.5 | 80 |
| 1926 | 875 | 393,786 | 538,002 | 57,056 | 11,523 | 65.3 | 714,492 | 351,060 | 237 | 43 | 15.3 | 65 |
| Del., Lack. & Western...1927 | 999 | 607,049 | 708,164 | 84,316 | 19,405 | 66.4 | 1,112,867 | 475,603 | 275 | 47 | 14.5 | 19 |
| 1926 | 993 | 614,009 | 726,161 | 95,318 | 19,428 | 67.5 | 1,115,546 | 494,099 | 275 | 54 | 16.3 | 11 |
| Erie (inc. Chic. & Erie)..1927 | 2,317 | 925,678 | 1,033,818 | 99,921 | 36,290 | 64.7 | 2,167,536 | 932,054 | 465 | 174 | 27.3 | 63 |
| 1926 | 2,323 | 950,462 | 1,044,451 | 109,418 | 36,292 | 65.0 | 2,182,161 | 958,624 | 559 | 123 | 18.0 | 118 |
| Lehigh Valley ....1927 | 1,346 | 600,468 | 658,346 | 73,022 | 18,703 | 64.2 | 1,113,118 | 493,928 | 365 | 82 | 18.3 | 61 |
| 1926 | 1,345 | 637,019 | 702,649 | 82,466 | 20,587 | 65.1 | 1,212,000 | 544,146 | 390 | 89 | 18.6 | 56 |
| Michigan Central ....1927 | 1,820 | 586,986 | 602,571 | 18,790 | 20,071 | 60.8 | 1,102,035 | 385,050 | 237 | 68 | 22.2 | 55 |
| 1926 | 1,835 | 615,535 | 632,014 | 20,788 | 21,669 | 62.1 | 1,170,758 | 409,662 | 274 | 50 | 15.3 | 85 |
| New York Central....1927 | 6,478 | 2,021,644 | 2,287,504 | 156,570 | 80,655 | 62.2 | 4,915,597 | 2,109,567 | 1,175 | 282 | 19.4 | 376 |
| 1926 | 6,482 | 2,093,449 | 2,354,936 | 160,385 | 80,857 | 64.4 | 4,753,709 | 2,055,338 | 1,195 | 336 | 21.9 | 361 |
| New York, Chic. & St. L.1927 | 1,665 | 610,587 | 615,303 | 6,244 | 20,771 | 65.9 | 1,118,522 | 424,838 | 230 | 58 | 20.1 | 51 |
| 1926 | 1,665 | 648,624 | 658,231 | 7,498 | 20,937 | 65.2 | 1,141,511 | 439,573 | 242 | 53 | 17.9 | 55 |
| Pere Marquette ....1927 | 2,180 | 433,533 | 439,577 | 6,909 | 11,263 | 64.8 | 638,328 | 266,625 | 180 | 41 | 18.5 | 13 |
| 1926 | 2,179 | 433,849 | 441,491 | 6,949 | 11,152 | 64.7 | 624,643 | 255,790 | 185 | 26 | 12.4 | 20 |
| Pitts. & Lake Erie....1927 | 231 | 115,951 | 117,991 | 1,469 | 4,557 | 63.9 | 357,581 | 208,914 | 58 | 18 | 23.7 | 15 |
| 1926 | 231 | 124,156 | 126,815 | 1,868 | 4,188 | 64.0 | 311,016 | 174,644 | 58 | 24 | 28.8 | 17 |
| Wabash ....1927 | 2,497 | 713,185 | 740,092 | 12,449 | 22,034 | 64.5 | 1,220,491 | 438,743 | 319 | 59 | 15.6 | 66 |
| 1926 | 2,497 | 746,875 | 774,417 | 11,487 | 22,939 | 65.8 | 1,275,236 | 495,253 | 306 | 68 | 18.2 | 55 |
| Central Eastern Region: | | | | | | | | | | | | |
| Baltimore & Ohio....1927 | 5,220 | 1,971,613 | 2,314,944 | 197,563 | 59,303 | 62.0 | 3,970,695 | 1,919,707 | 1,014 | 232 | 18.6 | 123 |
| 1926 | 5,197 | 1,973,230 | 2,279,990 | 181,814 | 58,113 | 62.0 | 3,764,162 | 1,778,318 | 1,019 | 200 | 16.4 | 151 |
| Central of New Jersey...1927 | 691 | 280,714 | 308,304 | 30,723 | 8,318 | 57.9 | 559,048 | 267,129 | 183 | 37 | 16.7 | 15 |
| 1926 | 691 | 277,619 | 304,124 | 42,311 | 8,232 | 59.8 | 554,225 | 263,875 | 231 | 35 | 13.2 | 62 |
| Chicago & Eastern Ill....1927 | 945 | 255,168 | 261,502 | 3,711 | 6,718 | 64.5 | 395,681 | 173,644 | 123 | 49 | 28.4 | 46 |
| 1926 | 945 | 231,599 | 232,474 | 3,561 | 6,528 | 64.9 | 373,302 | 165,119 | 127 | 36 | 22.3 | 50 |
| Clev., Cin., Chic. & St. L..1927 | 2,374 | 773,204 | 814,707 | 27,222 | 25,040 | 62.2 | 1,603,663 | 740,819 | 341 | 89 | 20.7 | 42 |
| 1926 | 2,374 | 740,878 | 775,754 | 27,454 | 24,009 | 62.5 | 1,531,899 | 713,121 | 338 | 104 | 23.5 | 36 |
| Elgin, Joliet & Eastern...1927 | 461 | 128,819 | 135,604 | 5,022 | 3,643 | 63.7 | 275,673 | 142,357 | 80 | 12 | 12.6 | ... |
| 1926 | 460 | 131,269 | 136,740 | 5,990 | 3,971 | 64.2 | 302,739 | 154,953 | 79 | 12 | 12.7 | ... |
| Long Island ....1927 | 393 | 51,348 | 56,213 | 14,941 | 701 | 55.3 | 47,311 | 19,309 | 52 | 10 | 15.5 | ... |
| 1926 | 393 | 51,618 | 57,660 | 16,049 | 685 | 53.7 | 45,997 | 18,240 | 48 | 9 | 15.8 | ... |
| Pennsylvania System ....1927 | 10,843 | 4,590,739 | 5,051,952 | 402,617 | 142,887 | 63.7 | 9,364,516 | 4,350,449 | 2,849 | 436 | 13.3 | 648 |
| 1926 | 10,880 | 4,799,988 | 5,182,918 | 375,730 | 143,247 | 64.0 | 9,270,798 | 4,299,055 | 2,649 | 588 | 18.2 | 354 |
| Reading ....1927 | 1,130 | 643,092 | 697,100 | 68,392 | 17,282 | 59.8 | 1,229,340 | 619,447 | 323 | 72 | 18.3 | 38 |
| 1926 | 1,131 | 660,057 | 722,054 | 69,777 | 17,959 | 60.8 | 1,234,097 | 622,591 | 365 | 68 | 15.7 | 69 |
| Pocahontas Region: | | | | | | | | | | | | |
| Chesapeake & Ohio....1927 | 2,650 | 1,205,718 | 1,298,177 | 51,877 | 40,773 | 56.0 | 3,298,022 | 1,770,626 | 545 | 84 | 13.4 | 44 |
| 1926 | 2,650 | 1,184,371 | 1,255,501 | 43,049 | 38,596 | 56.5 | 3,129,686 | 1,708,390 | 556 | 90 | 13.9 | 68 |
| Norfolk & Western....1927 | 2,232 | 902,154 | 1,098,888 | 40,568 | 31,874 | 58.4 | 2,691,211 | 1,452,968 | 554 | 51 | 8.5 | 131 |
| 1926 | 2,231 | 916,497 | 1,115,547 | 44,306 | 32,046 | 59.2 | 2,630,678 | 1,406,041 | 603 | 49 | 7.6 | 176 |
| Southern Region: | | | | | | | | | | | | |
| Atlantic Coast Line....1927 | 5,081 | 816,730 | 827,083 | 13,224 | 22,351 | 59.6 | 1,268,813 | 470,080 | 423 | 61 | 12.6 | 78 |
| 1926 | 4,928 | 916,350 | 939,241 | 16,484 | 24,540 | 60.2 | 1,401,689 | 533,396 | 445 | 45 | 9.2 | 44 |
| Central of Georgia....1927 | 1,898 | 301,072 | 304,767 | 5,422 | 7,363 | 71.0 | 397,694 | 171,045 | 137 | 26 | 16.0 | 10 |
| 1926 | 1,907 | 395,056 | 397,749 | 6,951 | 8,565 | 65.3 | 507,843 | 225,609 | 148 | 27 | 15.7 | 4 |
| I. C. (inc. Y. & M. V.)..1927 | 6,555 | 2,068,474 | 2,084,524 | 52,492 | 56,458 | 62.3 | 3,606,571 | 1,501,897 | 795 | 100 | 11.2 | 23 |
| 1926 | 6,555 | 1,978,486 | 1,990,542 | 46,425 | 54,672 | 63.7 | 3,390,059 | 1,416,853 | 770 | 96 | 11.1 | 24 |
| Louisville & Nashville....1927 | 5,048 | 1,865,862 | 1,951,867 | 63,339 | 39,805 | 59.7 | 2,721,659 | 1,297,504 | 609 | 123 | 16.8 | 11 |
| 1926 | 5,021 | 1,839,796 | 1,975,713 | 62,384 | 36,547 | 58.5 | 2,507,968 | 1,179,126 | 608 | 109 | 15.2 | 21 |
| Seaboard Air Line....1927 | 4,268 | 626,305 | 636,065 | 7,281 | 15,700 | 61.6 | 905,313 | 343,764 | 247 | 46 | 15.6 | 25 |
| 1926 | 3,905 | 584,579 | 597,351 | 8,094 | 15,065 | 63.0 | 854,891 | 336,997 | 274 | 29 | 9.5 | 11 |
| Southern Railway System.1927 | 8,021 | 2,122,197 | 2,153,555 | 38,649 | 53,957 | 63.6 | 3,022,468 | 1,196,758 | 1,068 | 151 | 12.4 | 42 |
| 1926 | 8,043 | 2,254,570 | 2,297,454 | 44,811 | 53,450 | 62.9 | 3,066,240 | 1,231,767 | 1,027 | 159 | 13.4 | 22 |
| Northwestern Region: | | | | | | | | | | | | |
| Chic. & North Western...1927 | 8,463 | 1,300,375 | 1,344,321 | 22,708 | 33,755 | 66.8 | 1,861,447 | 776,086 | 717 | 143 | 16.6 | 128 |
| 1926 | 8,457 | 1,493,734 | 1,536,937 | 26,433 | 38,378 | 64.0 | 2,246,114 | 875,563 | 734 | 164 | 18.3 | 100 |
| Chic., Milw. & St. P....1927 | 11,202 | 1,517,445 | 1,620,790 | 98,699 | 46,616 | 65.5 | 2,630,397 | 1,113,431 | 792 | 175 | 18.1 | 183 |
| 1926 | 11,190 | 1,465,329 | 1,566,734 | 95,935 | 44,664 | 66.9 | 2,464,467 | 1,055,446 | 868 | 202 | 18.9 | 220 |
| Chic., St. P., Minn. & Om.1927 | 1,724 | 284,828 | 303,563 | 11,911 | 6,140 | 69.2 | 324,479 | 134,601 | 161 | 37 | 18.6 | 38 |
| 1926 | 1,819 | 304,984 | 328,147 | 12,547 | 6,165 | 65.7 | 331,595 | 131,183 | 167 | 32 | 15.9 | 3 |
| Great Northern ....1927 | 8,164 | 745,770 | 769,845 | 42,135 | 28,404 | 66.4 | 1,709,059 | 828,906 | 530 | 168 | 24.0 | 130 |
| 1926 | 8,221 | 730,195 | 758,898 | 43,304 | 27,562 | 66.1 | 1,638,266 | 783,008 | 565 | 154 | 21.4 | 139 |
| M., St. P. & S. Ste. M..1927 | 4,368 | 454,430 | 468,267 | 3,738 | 12,343 | 68.9 | 642,543 | 280,496 | 294 | 29 | 9.1 | 19 |
| 1926 | 4,372 | 516,319 | 529,926 | 4,293 | 13,406 | 68.0 | 709,250 | 312,755 | 298 | 43 | 12.5 | 23 |
| Northern Pacific ....1927 | 6,496 | 756,120 | 807,258 | 42,503 | 25,819 | 70.8 | 1,411,929 | 638,625 | 466 | 147 | 23.9 | 85 |
| 1926 | 6,510 | 809,596 | 847,865 | 45,694 | 27,301 | 68.7 | 1,517,554 | 667,574 | 499 | 142 | 22.1 | 97 |
| Oreg.-Wash. R. R. & Nav.1927 | 2,154 | 184,534 | 193,887 | 13,830 | 5,367 | 72.6 | 301,805 | 137,724 | 135 | 17 | 11.4 | 9 |
| 1926 | 2,185 | 188,003 | 199,059 | 15,938 | 5,940 | 74.9 | 323,034 | 151,977 | 132 | 21 | 13.6 | 14 |
| Central Western Region: | | | | | | | | | | | | |
| Atch., Top. & S. Fe 1927 | 10,377 | 1,638,273 | 1,755,140 | 90,419 | 53,000 | 64.3 | 3,117,489 | 1,155,801 | 754 | 167 | 18.1 | 143 |
| (incl. P. & S. F.)....1926 | 10,143 | 1,520,081 | 1,628,418 | 82,225 | 47,429 | 65.5 | 2,747,809 | 1,029,311 | 794 | 146 | 15.6 | 228 |
| Chicago & Alton....1927 | 995 | 266,587 | 281,123 | 2,183 | 6,246 | 58.7 | 384,034 | 135,865 | 143 | 14 | 9.1 | 44 |
| 1926 | 1,022 | 289,499 | 320,248 | 4,278 | 7,199 | 59.8 | 447,932 | 167,350 | 143 | 19 | 11.8 | 38 |
| Chic., Burl. & Quincy....1927 | 9,334 | 1,350,221 | 1,400,126 | 58,115 | 39,953 | 64.2 | 2,211,778 | 940,608 | 733 | 184 | 20.1 | 78 |
| 1926 | 9,349 | 1,429,372 | 1,470,049 | 51,552 | 43,297 | 63.8 | 2,482,067 | 1,097,900 | 804 | 197 | 19.6 | 102 |
| Chic., Rock. I. & Pacific.1927 | 7,562 | 1,440,799 | 1,489,880 | 17,454 | 35,594 | 60.8 | 2,080,474 | 789,443 | 548 | 115 | 17.3 | 30 |
| 1926 | 7,564 | 1,408,740 | 1,476,548 | 19,565 | 35,133 | 63.8 | 1,965,194 | 743,547 | 554 | 151 | 21.4 | 38 |
| Denver & R. G. Wn....1927 | 2,552 | 222,533 | 263,682 | 45,406 | 6,528 | 70.7 | 366,397 | 173,556 | 220 | 47 | 17.5 | 34 |
| 1926 | 2,564 | 230,928 | 282,223 | 50,557 | 6,702 | 69.1 | 382,229 | 177,213 | 235 | 51 | 17.8 | 35 |
| Oregon Short Line....1927 | 2,539 | 249,005 | 267,657 | 24,640 | 7,317 | 70.0 | 422,989 | 189,648 | 180 | 26 | 12.5 | 53 |
| 1926 | 2,537 | 274,016 | 285,010 | 19,069 | 8,082 | 72.2 | 456,375 | 208,317 | 188 | 27 | 12.4 | 65 |
| Sou. Pac.—Pac. Lines...1927 | 8,750 | 1,625,296 | 1,762,571 | 236,652 | 49,665 | 62.2 | 3,047,894 | 1,117,941 | 725 | 223 | 23.5 | 58 |
| 1926 | 8,533 | 1,609,087 | 1,761,481 | 291,414 | 50,166 | 64.4 | 3,021,325 | 1,138,521 | 735 | 185 | 20.1 | 57 |
| Union Pacific ....1927 | 3,714 | 807,678 | 829,882 | 41,062 | 34,154 | 76.4 | 1,720,008 | 680,717 | 442 | 51 | 10.3 | 183 |
| 1926 | 3,691 | 835,446 | 859,941 | 43,532 | 34,567 | 76.9 | 1,768,733 | 742,863 | 448 | 71 | 13.6 | 164 |
| Southwestern Region: | | | | | | | | | | | | |
| Gulf, Colo. & S. Fe....1927 | 1,933 | 321,610 | 334,624 | 8,986 | 9,770 | 60.4 | 631,242 | 272,909 | 130 | 29 | 18.2 | 17 |
| 1926 | 1,897 | 279,764 | 290,230 | 6,214 | 8,073 | 62.6 | 496,821 | 212,462 | 112 | 25 | 18.1 | 17 |
| Mo.-Kans.-Tex. ....1927 | 1,787 | 271,426 | 272,012 | 5,645 | 9,445 | 56.9 | 573,319 | 207,712 | 101 | 19 | 15.6 | 34 |
| 1926 | 1,787 | 254,960 | 255,031 | 4,458 | 8,907 | 59.8 | 520,134 | 193,864 | 107 | 24 | 18.5 | 39 |
| Mo.-Kans.-Tex. of Tex...1927 | 1,389 | 166,649 | 170,842 | 3,722 | 4,654 | 57.0 | 288,028 | 109,824 | 118 | 11 | 8.6 | 64 |
| 1926 | 1,389 | 173,489 | 177,329 | 3,000 | 4,570 | 61.3 | 268,901 | 106,973 | 124 | 21 | 14.6 | 60 |
| Missouri Pacific ....1927 | 7,317 | 1,294,773 | 1,350,907 | 45,059 | 37,558 | 67.6 | 2,124,967 | 914,092 | 540 | 61 | 10.2 | 2 |
| 1926 | 7,311 | 1,347,586 | 1,392,255 | 44,847 | 39,022 | 65.3 | 2,264,305 | 969,654 | 531 | 88 | 14.2 | 1 |
| St. Louis-San Francisco..1927 | 4,860 | 822,181 | 842,205 | 12,037 | 20,330 | 63.3 | 1,203,296 | 494,396 | 400 | 55 | 12.0 | 64 |
| 1926 | 4,895 | 811,628 | 832,826 | 14,902 | 19,672 | 61.9 | 1,168,968 | 480,482 | 431 | 63 | 12.8 | 69 |
| Texas & New Orleans....1927 | 4,570 | 830,048 | 837,068 | 870 | 18,581 | 64.6 | 1,111,125 | 464,820 | 253 | 58 | 18.7 | 24 |
| 1926 | 4,460 | 705,077 | 707,204 | 2,571 | 15,067 | 66.4 | 842,674 | 340,439 | 264 | 64 | 19.5 | 33 |
| Texas & Pacific....1927 | 1,954 | 382,496 | 382,496 | 3,177 | 10,083 | 60.8 | 614,029 | 225,866 | 159 | 18 | 10.1 | 16 |
| 1926 | 1,953 | 308,222 | 308,222 | 913 | 8,487 | 61.3 | 499,075 | 179,533 | 160 | 22 | 12.2 | 22 |

*Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.*

## Compared with May, 1926, for Roads with Annual Operating Revenues Above $25,000,000

| Region, road and year | Average number of freight cars on line daily: Home | Foreign | Total | Per cent unserviceable | Gross ton-miles per train-hour, excluding locomotive and tender | Gross tons per train, excluding locomotive and tender | Net tons per train | Net tons per loaded car | Net ton-miles per car-day | Car miles per car-day | Net ton-miles per mile of road per day | Pounds of coal per 1,000 gross ton-miles including locomotive and tender | Locomotive miles per locomotive day |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New England Region: | | | | | | | | | | | | | |
| Boston & Albany....1927 | 3,265 | 5,235 | 8,500 | 2.8 | 18,004 | 1,340 | 500 | 19.3 | 395 | 30.5 | 8,250 | 170 | 63.4 |
| 1926 | 2,451 | 5,386 | 7,837 | 5.4 | 15,437 | 1,189 | 452 | 19.5 | 453 | 34.3 | 8,727 | 167 | 65.8 |
| Boston & Maine....1927 | 13,482 | 12,137 | 25,619 | 6.8 | 15,988 | 1,326 | 535 | 20.6 | 342 | 23.7 | 4,206 | 121 | 58.6 |
| 1926 | 13,358 | 14,438 | 27,796 | 7.3 | 14,952 | 1,367 | 557 | 20.2 | 324 | 22.5 | 4,001 | 129 | 49.6 |
| N. Y., New H. & Hartf..1927 | 23,060 | 18,633 | 41,693 | 16.9 | 19,725 | 1,495 | 611 | 21.6 | 279 | 19.1 | 5,431 | 117 | 56.4 |
| 1926 | 20,933 | 21,570 | 42,503 | 16.1 | 18,649 | 1,540 | 645 | 21.9 | 281 | 18.8 | 5,526 | 123 | 57.4 |
| Great Lakes Region: | | | | | | | | | | | | | |
| Delaware & Hudson....1927 | 9,050 | 5,971 | 15,021 | 4.4 | 23,425 | 1,881 | 914 | 31.5 | 712 | 36.2 | 12,223 | 146 | 62.4 |
| 1926 | 8,505 | 6,617 | 15,122 | 5.7 | 22,578 | 1,814 | 891 | 30.5 | 749 | 37.7 | 12,939 | 153 | 68.5 |
| Del., Lack. & Western...1927 | 17,049 | 8,333 | 25,382 | 2.6 | 22,638 | 1,833 | 783 | 24.5 | 604 | 37.1 | 15,353 | 135 | 79.4 |
| 1926 | 16,909 | 8,598 | 25,507 | 4.3 | 21,914 | 1,817 | 805 | 25.4 | 625 | 36.4 | 16,058 | 153 | 80.8 |
| Erie (inc. Chic. & Erie)..1927 | 35,136 | 19,258 | 54,394 | 7.1 | 26,646 | 2,342 | 1,007 | 25.7 | 553 | 33.3 | 12,975 | 125 | 57.2 |
| 1926 | 35,873 | 20,553 | 56,426 | 6.8 | 26,104 | 2,296 | 1,009 | 26.4 | 548 | 31.9 | 13,313 | 120 | 54.6 |
| Lehigh Valley .....1927 | 23,195 | 9,434 | 32,629 | 9.7 | 26,006 | 1,854 | 823 | 26.4 | 488 | 28.8 | 11,840 | 143 | 52.9 |
| 1926 | 21,507 | 10,280 | 31,787 | 6.0 | 25,231 | 1,903 | 854 | 26.4 | 552 | 32.1 | 13,046 | 142 | 52.9 |
| Michigan Central .....1927 | 16,888 | 17,648 | 34,536 | 4.6 | 28,620 | 1,877 | 656 | 19.2 | 360 | 30.8 | 6,826 | 106 | 65.9 |
| 1926 | 17,275 | 17,723 | 34,998 | 4.7 | 27,362 | 1,902 | 666 | 18.9 | 378 | 32.1 | 7,202 | 107 | 65.0 |
| New York Central.....1927 | 69,400 | 73,156 | 142,556 | 3.7 | 30,503 | 2,431 | 1,043 | 26.2 | 477 | 29.3 | 10,505 | 105 | 54.1 |
| 1926 | 72,075 | 74,567 | 146,642 | 3.9 | 28,341 | 2,271 | 982 | 25.4 | 452 | 27.6 | 10,228 | 110 | 53.0 |
| New York, Chic. & St. L..1927 | 13,347 | 9,846 | 23,193 | 5.4 | 25,082 | 1,832 | 696 | 20.5 | 591 | 43.8 | 8,231 | 106 | 69.6 |
| 1926 | 13,077 | 10,311 | 23,388 | 6.3 | 24,314 | 1,760 | 678 | 21.0 | 606 | 44.3 | 8,517 | 106 | 73.0 |
| Pere Marquette .....1927 | 11,105 | 8,419 | 19,524 | 3.4 | 18,157 | 1,472 | 615 | 23.7 | 441 | 28.7 | 3,945 | 105 | 65.3 |
| 1926 | 9,978 | 9,218 | 19,196 | 4.3 | 17,235 | 1,440 | 590 | 22.9 | 430 | 29.0 | 3,787 | 107 | 68.7 |
| Pitts. & Lake Erie.....1927 | 13,425 | 7,643 | 21,068 | 4.0 | 33,419 | 3,084 | 1,802 | 45.8 | 320 | 10.9 | 29,116 | 95 | 50.8 |
| 1926 | 15,493 | 7,581 | 23,074 | 6.6 | 27,879 | 2,505 | 1,407 | 41.7 | 244 | 9.1 | 24,340 | 74 | 50.7 |
| Wabash ..... 1927 | 15,203 | 11,503 | 26,706 | 2.8 | 26,876 | 1,711 | 615 | 19.9 | 530 | 41.3 | 5,668 | 124 | 64.2 |
| 1926 | 15,015 | 10,018 | 25,033 | 2.8 | 25,991 | 1,707 | 663 | 21.6 | 638 | 44.9 | 6,398 | 119 | 67.7 |
| Central Eastern Region: | | | | | | | | | | | | | |
| Baltimore & Ohio.....1927 | 73,613 | 33,698 | 107,311 | 4.3 | 21,915 | 2,014 | 974 | 32.4 | 577 | 28.8 | 11,864 | 145 | 65.0 |
| 1926 | 69,308 | 34,458 | 103,766 | 3.6 | 20,894 | 1,908 | 901 | 30.6 | 553 | 29.1 | 11,037 | 151 | 65.1 |
| Central of New Jersey...1927 | 18,432 | 11,034 | 29,466 | 4.9 | 19,287 | 1,992 | 952 | 32.1 | 292 | 15.7 | 12,472 | 148 | 49.9 |
| 1926 | 18,120 | 12,652 | 30,772 | 5.4 | 18,247 | 1,996 | 950 | 32.1 | 277 | 14.4 | 12,320 | 154 | 42.0 |
| Chicago & Eastern Ill....1927 | 14,213 | 4,447 | 18,660 | 21.1 | 21,409 | 1,551 | 681 | 25.8 | 300 | 18.0 | 5,927 | 137 | 50.0 |
| 1926 | 14,580 | 4,048 | 18,628 | 16.7 | 22,051 | 1,612 | 713 | 25.3 | 286 | 17.4 | 5,636 | 133 | 46.6 |
| Clev., Cin., Chic. & St. L.1927 | 18,272 | 21,532 | 39,804 | 5.2 | 26,889 | 2,074 | 958 | 29.6 | 600 | 32.6 | 10,067 | 116 | 63.2 |
| 1926 | 20,465 | 21,399 | 41,864 | 4.6 | 26,308 | 2,068 | 963 | 29.7 | 549 | 29.6 | 9,690 | 115 | 58.7 |
| Elgin, Joliet & Eastern...1927 | 9,237 | 6,862 | 16,099 | 6.7 | 14,198 | 2,140 | 1,105 | 39.1 | 285 | 11.5 | 9,971 | 131 | 49.8 |
| 1926 | 9,872 | 7,768 | 17,640 | 5.0 | 16,337 | 2,306 | 1,180 | 39.0 | 283 | 11.3 | 10,867 | 127 | 50.6 |
| Long Island .....1927 | 1,752 | 6,260 | 8,012 | 1.3 | 5,024 | 921 | 376 | 27.5 | 78 | 5.1 | 1,584 | 306 | 37.0 |
| 1926 | 2,045 | 7,656 | 9,701 | 0.8 | 5,169 | 891 | 353 | 26.6 | 61 | 4.2 | 1,496 | 284 | 41.9 |
| Pennsylvania System ....1927 | 216,876 | 81,379 | 298,255 | 5.2 | 23,326 | 2,040 | 948 | 30.4 | 471 | 24.3 | 12,943 | 119 | 53.6 |
| 1926 | 215,258 | 86,257 | 301,515 | 9.3 | 21,619 | 1,931 | 896 | 30.0 | 460 | 23.9 | 12,747 | 123 | 55.4 |
| Reading .....1927 | 25,737 | 13,370 | 39,107 | 3.0 | 21,306 | 1,912 | 963 | 35.9 | 511 | 23.9 | 17,685 | 149 | 62.5 |
| 1926 | 25,805 | 14,898 | 40,703 | 3.6 | 21,059 | 1,870 | 943 | 34.7 | 493 | 23.4 | 17,763 | 156 | 59.0 |
| Pocahontas Region: | | | | | | | | | | | | | |
| Chesapeake & Ohio.....1927 | 28,205 | 13,420 | 41,625 | 2.9 | 31,005 | 2,735 | 1,469 | 43.4 | 1,372 | 56.5 | 21,553 | 92 | 69.2 |
| 1926 | 30,484 | 9,832 | 40,316 | 3.1 | 29,713 | 2,642 | 1,442 | 44.3 | 1,367 | 54.7 | 20,794 | 93 | 64.9 |
| Norfolk & Western.....1927 | 28,183 | 8,942 | 37,125 | 2.3 | 38,991 | 2,983 | 1,611 | 45.6 | 1,263 | 47.4 | 21,002 | 129 | 60.7 |
| 1926 | 30,028 | 9,384 | 39,412 | 1.9 | 37,431 | 2,870 | 1,534 | 43.9 | 1,151 | 44.3 | 20,327 | 133 | 57.4 |
| Southern Region: | | | | | | | | | | | | | |
| Atlantic Coast Line.....1927 | 22,909 | 11,368 | 34,277 | 4.7 | 20,955 | 1,554 | 576 | 21.0 | 442 | 35.3 | 2,985 | 105 | 56.0 |
| 1926 | 23,367 | 16,148 | 39,515 | 4.0 | 19,481 | 1,530 | 582 | 21.7 | 435 | 33.3 | 3,492 | 117 | 62.9 |
| Central of Georgia.....1927 | 4,620 | 5,584 | 10,204 | 3.9 | 19,089 | 1,321 | 568 | 23.2 | 541 | 32.8 | 2,908 | 130 | 61.4 |
| 1926 | 5,336 | 6,124 | 11,460 | 4.0 | 17,972 | 1,285 | 571 | 26.3 | 635 | 36.9 | 3,817 | 147 | 74.6 |
| I. C. (inc. Y. & M. V.)..1927 | 42,936 | 25,720 | 68,656 | 6.6 | 23,644 | 1,744 | 726 | 26.6 | 706 | 42.6 | 7,391 | 120 | 77.0 |
| 1926 | 42,025 | 23,159 | 65,184 | 4.2 | 23,015 | 1,713 | 716 | 25.9 | 701 | 42.5 | 6,973 | 124 | 75.9 |
| Louisville & Nashville....1927 | 44,014 | 21,034 | 65,048 | 8.7 | 17,478 | 1,459 | 695 | 32.6 | 643 | 33.0 | 8,291 | 140 | 88.8 |
| 1926 | 46,168 | 17,216 | 63,384 | 9.1 | 16,364 | 1,363 | 641 | 32.3 | 600 | 31.8 | 7,575 | 152 | 89.5 |
| Seaboard Air Line.....1927 | 15,234 | 8,991 | 24,225 | 5.2 | 17,677 | 1,445 | 549 | 21.9 | 458 | 33.9 | 2,599 | 130 | 71.0 |
| 1926 | 12,451 | 10,952 | 23,403 | 1.8 | 17,334 | 1,462 | 576 | 22.4 | 465 | 33.0 | 2,784 | 129 | 64.5 |
| Southern Railway System.1927 | 56,407 | 25,675 | 82,082 | 6.0 | 20,070 | 1,424 | 564 | 22.2 | 470 | 33.3 | 4,813 | 146 | 58.0 |
| 1926 | 53,551 | 27,936 | 81,487 | 5.2 | 18,344 | 1,360 | 546 | 23.0 | 488 | 33.7 | 4,940 | 150 | 63.7 |
| Northwestern Region: | | | | | | | | | | | | | |
| Chic. & North Western...1927 | 50,852 | 27,393 | 78,245 | 7.8 | 17,657 | 1,431 | 597 | 23.0 | 320 | 20.8 | 2,958 | 131 | 51.3 |
| 1926 | 49,136 | 25,216 | 74,352 | 7.1 | 18,391 | 1,504 | 586 | 22.8 | 380 | 26.0 | 3,340 | 129 | 56.2 |
| Chic., Milw. & St. P....1927 | 53,453 | 20,145 | 73,598 | 6.2 | 21,849 | 1,733 | 734 | 23.9 | 488 | 31.2 | 3,206 | 135 | 57.3 |
| 1926 | 55,840 | 19,513 | 75,353 | 6.0 | 20,915 | 1,682 | 720 | 23.6 | 452 | 28.6 | 3,043 | 131 | 50.1 |
| Chic., St. P., Minn. & Om.1927 | 3,122 | 8,336 | 11,458 | 9.6 | 14,674 | 1,139 | 473 | 21.9 | 379 | 25.0 | 2,519 | 123 | 51.5 |
| 1926 | 3,329 | 8,251 | 11,580 | 9.9 | 13,838 | 1,087 | 430 | 21.3 | 365 | 26.1 | 2,327 | 141 | 55.3 |
| Great Northern .....1927 | 40,935 | 7,176 | 48,111 | 7.3 | 27,415 | 2,292 | 1,111 | 29.2 | 556 | 28.7 | 3,275 | 120 | 37.6 |
| 1926 | 42,424 | 7,722 | 50,146 | 10.0 | 25,968 | 2,244 | 1,072 | 28.4 | 504 | 26.8 | 3,072 | 117 | 36.0 |
| M., St. P. & S. Ste. M..1927 | 19,918 | 5,252 | 25,170 | 4.3 | 16,588 | 1,414 | 617 | 22.7 | 367 | 23.4 | 2,071 | 107 | 47.1 |
| 1926 | 18,799 | 5,873 | 24,672 | 5.7 | 15,737 | 1,374 | 606 | 23.3 | 409 | 25.8 | 2,308 | 105 | 50.7 |
| Northern Pacific .....1927 | 37,876 | 6,457 | 44,333 | 8.1 | 23,872 | 1,867 | 845 | 24.7 | 465 | 26.5 | 3,171 | 137 | 44.7 |
| 1926 | 35,477 | 7,306 | 42,783 | 7.8 | 24,036 | 1,874 | 825 | 24.5 | 503 | 30.0 | 3,308 | 133 | 45.0 |
| Oreg.-Wash. R. R. & Nav.1927 | 7,196 | 4,017 | 11,213 | 5.2 | 20,527 | 1,635 | 746 | 25.7 | 396 | 21.3 | 2,062 | 174 | 44.1 |
| 1926 | 7,493 | 3,473 | 10,966 | 5.6 | 20,474 | 1,718 | 808 | 25.6 | 447 | 23.3 | 2,243 | 167 | 45.5 |
| Central Western Region: | | | | | | | | | | | | | |
| Atch., Top. & S. Fe 1927 | 59,210 | 18,106 | 77,316 | 5.8 | 26,679 | 1,903 | 705 | 21.8 | 482 | 34.4 | 3,593 | 111 | 64.6 |
| (incl. P. & S. F.)....1926 | 61,796 | 16,028 | 77,824 | 6.0 | 25,465 | 1,808 | 677 | 21.7 | 427 | 30.0 | 3,274 | 115 | 58.7 |
| Chicago & Alton.....1927 | 10,555 | 4,367 | 14,922 | 3.6 | 18,584 | 1,441 | 510 | 21.8 | 294 | 23.0 | 4,405 | 158 | 58.2 |
| 1926 | 10,466 | 4,471 | 14,937 | 7.0 | 19,942 | 1,547 | 578 | 23.2 | 361 | 26.0 | 5,283 | 154 | 64.6 |
| Chic., Burl. & Quincy....1927 | 50,877 | 15,812 | 66,689 | 5.0 | 21,590 | 1,638 | 697 | 23.5 | 455 | 30.1 | 3,251 | 136 | 51.3 |
| 1926 | 52,608 | 16,355 | 68,963 | 6.5 | 22,766 | 1,736 | 768 | 25.4 | 514 | 31.8 | 3,788 | 132 | 49.0 |
| Chic., Rock. I. & Pacific.1927 | 33,400 | 20,835 | 54,235 | 7.8 | 18,208 | 1,444 | 548 | 22.2 | 470 | 34.8 | 3,368 | 134 | 73.3 |
| 1926 | 35,446 | 18,450 | 53,896 | 10.5 | 18,583 | 1,395 | 528 | 21.2 | 445 | 32.9 | 3,171 | 139 | 68.4 |
| Denver & R. G. Wn.....1927 | 11,640 | 2,767 | 14,407 | 3.2 | 17,638 | 1,647 | 780 | 26.6 | 389 | 20.7 | 2,194 | 181 | 37.5 |
| 1926 | 11,774 | 2,711 | 14,485 | 3.1 | 16,970 | 1,655 | 767 | 26.4 | 395 | 21.6 | 2,229 | 185 | 37.5 |
| Oregon Short Line.....1927 | 8,037 | 4,838 | 12,875 | 4.1 | 23,434 | 1,699 | 762 | 25.9 | 475 | 26.2 | 2,409 | 117 | 45.9 |
| 1926 | 8,645 | 3,127 | 11,772 | 5.4 | 23,170 | 1,666 | 760 | 25.8 | 571 | 30.7 | 2,649 | 122 | 45.8 |
| Sou. Pac.—Pac. Lines...1927 | 34,771 | 31,406 | 66,177 | 5.1 | 23,567 | 1,875 | 688 | 22.5 | 545 | 38.9 | 4,121 | 121 | 68.1 |
| 1926 | 32,797 | 30,527 | 63,324 | 5.8 | 23,138 | 1,878 | 708 | 22.7 | 580 | 39.7 | 4,304 | 124 | 72.0 |
| Union Pacific .....1927 | 23,266 | 8,161 | 31,427 | 13.7 | 35,894 | 2,130 | 843 | 19.9 | 699 | 45.9 | 5,912 | 108 | 57.0 |
| 1926 | 20,685 | 7,643 | 28,328 | 14.2 | 35,418 | 2,117 | 889 | 21.5 | 846 | 51.2 | 6,492 | 110 | 56.3 |
| Southwestern Region: | | | | | | | | | | | | | |
| Gulf, Colo. & S. Fe.....1927 | 9,378 | 6,414 | 15,792 | 4.2 | 27,818 | 1,963 | 849 | 27.9 | 558 | 33.1 | 4,554 | 98 | 69.7 |
| 1926 | 8,945 | 4,267 | 13,212 | 3.6 | 26,521 | 1,776 | 759 | 26.3 | 519 | 31.5 | 3,613 | 102 | 69.7 |
| Mo.-Kans.-Tex. .....1927 | 8,845 | 4,150 | 12,995 | 5.3 | 29,041 | 2,112 | 765 | 22.0 | 516 | 41.2 | 3,749 | 96 | 74.8 |
| 1926 | 9,111 | 3,643 | 12,754 | 4.9 | 29,612 | 2,040 | 760 | 21.8 | 490 | 37.7 | 3,499 | 89 | 63.7 |
| Mo.-Kans.-Tex. of Tex...1927 | 306 | 9,834 | 10,140 | 8.4 | 22,921 | 1,728 | 659 | 23.6 | 349 | 26.0 | 2,550 | 102 | 43.5 |
| 1926 | 321 | 9,163 | 9,484 | 8.4 | 20,710 | 1,550 | 617 | 23.4 | 364 | 25.4 | 2,484 | 102 | 40.1 |
| Missouri Pacific .....1927 | 29,483 | 21,220 | 50,703 | 4.6 | 20,383 | 1,641 | 706 | 24.3 | 582 | 35.4 | 4,030 | 128 | 74.9 |
| 1926 | 29,468 | 18,580 | 48,048 | 7.3 | 21,892 | 1,680 | 720 | 24.8 | 651 | 40.1 | 4,279 | 121 | 74.9 |
| St. Louis-San Francisco..1927 | 22,203 | 11,079 | 33,282 | 3.4 | 19,325 | 1,464 | 601 | 24.3 | 479 | 31.1 | 3,282 | 147 | 60.6 |
| 1926 | 20,468 | 10,777 | 31,245 | 5.2 | 19,049 | 1,440 | 592 | 24.4 | 496 | 32.8 | 3,166 | 142 | 55.4 |
| Texas & New Orleans....1927 | 11,214 | 15,400 | 26,614 | 6.2 | 19,021 | 1,339 | 560 | 25.0 | 563 | 34.8 | 3,281 | 101 | 87.0 |
| 1926 | 11,762 | 13 681 | 25,443 | 7.3 | 17,017 | 1,195 | 483 | 22.6 | 432 | 28.8 | 2,462 | 113 | 69.8 |
| Texas & Pacific.....1927 | 6,078 | 6,163 | 12,241 | 4.3 | 20,462 | 1,605 | 591 | 22.4 | 595 | 43.7 | 3,729 | 108 | 70.2 |
| 1926 | 6,717 | 5,601 | 12,318 | 5.5 | 21,207 | 1,619 | 582 | 21.2 | 470 | 36.3 | 2,965 | 102 | 54.8 |

# News of the Week

(*Continued from page* 159)

tions as of April 1, this year, amounted to $724,853,000, compared with $821,880,000 on the same date in 1926, and $750,000,000 on the same date in 1925.

From these figures the bureau estimated that expenditures for the year 1927 would approximate from $700,000,000 to $750,000,000.

This estimate for 1927 compares with actual capital expenditures during the past five years as follows:

| Year | Amount |
|---|---|
| 1922 | $429,273,000 |
| 1923 | 1,059,149,000 |
| 1924 | 874,743,000 |
| 1925 | 748,191,000 |
| 1926 | 885,086,000 |

Expenditures made in the first three months in 1927 for equipment totaled $55,346,000, a decrease of $19,554,000 compared with the first quarter in 1926 and a decrease of $42,354,000 compared with the corresponding period in 1925. This decrease, however, the bureau explained, was largely due to a reduction in expenditure for freight cars.

Expenditures actually made in the first three months this year for locomotives amounted to $19,771,000, which exceeded similar expenditures made during the corresponding periods in the two previous years.

For freight cars, expenditures amounted to $18,192,000, compared with $44,500,000 in the first quarter of 1926 and $73,300,000 in the first quarter in 1925.

For passenger cars, expenditures in the first three months this year amounted to $12,346,000, which exceeded similar expenditures made during the corresponding period in the years of 1925 and 1926.

Total expenditures for roadway and structures in the first three months this year amounted to $99,676,000, an increase of $8,876,000 over the same period last year and an increase of $28,076,000 over the corresponding period two years ago.

Expenditures for additional track in the first three months in 1927 amounted to $30,145,000, compared with $30,900,000 during the corresponding period last year. For heavier rail, expenditures totaled $8,275,000, compared with $7,200,000 in 1926.

For shops and enginehouses, including machinery and tools, expenditures were $10,941,000, or an increase of $2,741,000 above similar expenditures last year. For all other improvements, $50,315,000 was spent in the first quarter this year, an increase of approximately $6,000,000 compared with the same period in 1926.

## Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 182 Steam Railways, including 14 Switching and Terminal Companies

FOR THE MONTH OF MAY, 1927 AND 1926

| Item | United States | | Eastern District | | Pocahontas Region | | Southern Region | | Western District | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1927 | 1926 | 1927 | 1926 | 1927 | 1926 | 1927 | 1926 | 1927 | 1926 |
| Average number of miles operated | 238,077.88 | 237,346.09 | 59,102.79 | 59,209.10 | 5,554.64 | 5,554.39 | 39,632.57 | 39,187.02 | 133,787.88 | 133,395.58 |
| Revenues: | | | | | | | | | | |
| Freight | $390,680,240 | $385,509,631 | $176,464,999 | $175,259,529 | $21,457,807 | $20,386,934 | $54,500,916 | $53,524,344 | $138,256,518 | $136,338,824 |
| Passenger | *a* 78,532,414 | *b* 82,823,540 | 41,245,612 | 42,226,683 | 1,667,608 | 1,781,024 | 9,735,837 | 12,049,556 | 25,883,357 | 26,766,277 |
| Mail | 7,933,947 | 7,977,637 | 3,055,604 | 3,059,209 | 197,454 | 207,224 | 1,200,592 | 1,194,020 | 3,480,297 | 3,517,184 |
| Express | 12,139,696 | 12,484,572 | 5,274,855 | 5,875,925 | 248,550 | 257,985 | 1,788,353 | 1,784,018 | 4,827,938 | 4,566,644 |
| All other transportat'n | 17,571,056 | 17,690,600 | 10,156,841 | 10,326,899 | 202,426 | 217,664 | 892,733 | 967,008 | 6,319,056 | 6,179,029 |
| Incidental | 10,949,187 | 10,873,154 | 5,516,875 | 5,525,010 | 414,724 | 382,517 | 1,045,519 | 1,270,548 | 3,972,069 | 3,695,079 |
| Joint facility—Cr. | 1,132,537 | 1,040,509 | 434,577 | 415,311 | 16,261 | 12,611 | 146,267 | 145,536 | 535,432 | 467,051 |
| Joint facility—Dr. | 370,126 | 357,386 | 135,533 | 133,151 | 1,954 | 1,771 | 31,673 | 32,037 | 200,966 | 190,427 |
| Ry. operat'g revenues | 518,568,951 | 518,042,257 | 242,013,830 | 242,555,415 | 24,202,876 | 23,244,188 | 69,278,544 | 70,902,993 | 183,073,701 | 181,339,661 |
| Expenses: | | | | | | | | | | |
| Maintenance of way and structures | 80,519,830 | 77,054,106 | 32,455,264 | 31,510,067 | 3,624,359 | 3,108,905 | 10,502,126 | 10,704,056 | 33,938,081 | 31,731,078 |
| Mainten'ce of equipm't | 102,119,909 | 107,005,052 | 48,395,748 | 51,357,311 | 5,028,252 | 4,868,902 | 13,776,858 | 14,365,507 | 34,919,051 | 36,413,332 |
| Traffic | 10,375,480 | 9,584,087 | 3,805,043 | 3,383,180 | 272,692 | 246,101 | 1,750,835 | 1,675,273 | 4,546,910 | 4,279,533 |
| Transportation | 178,394,916 | 176,846,345 | 84,856,484 | 83,710,477 | 6,110,683 | 5,939,690 | 24,149,099 | 25,017,731 | 63,278,650 | 62,178,447 |
| Miscellaneous operat'ns | 4,565,370 | 4,538,557 | 2,157,012 | 2,111,212 | 86,185 | 97,315 | 474,852 | 527,936 | 1,847,321 | 1,802,094 |
| General | 16,121,630 | 15,354,910 | 7,256,033 | 7,030,609 | 568,865 | 472,099 | 2,100,945 | 1,989,644 | 6,195,787 | 5,862,558 |
| Transportation for investment—Cr. | 1,310,616 | 1,238,017 | 232,065 | 163,049 | 46,600 | 37,552 | 93,315 | 203,241 | 938,636 | 834,175 |
| Ry. operat'g expenses | 390,786,519 | 389,145,040 | 178,693,519 | 178,939,807 | 15,644,436 | 14,695,460 | 52,661,400 | 54,076,906 | 143,787,164 | 141,432,867 |
| Net revenue from railway operations | 127,782,432 | 128,897,217 | 63,320,311 | 63,615,608 | 8,558,440 | 8,548,728 | 16,617,144 | 16,826,087 | 39,286,537 | 39,906,794 |
| Railway tax accruals | 32,374,914 | 31,796,690 | 14,083,432 | 13,734,233 | 1,774,638 | 1,518,031 | 4,304,796 | 4,304,650 | 12,212,048 | 12,239,776 |
| Uncollectible ry. rev's. | 139,102 | 152,488 | 55,252 | 81,430 | 8,082 | 2,698 | 20,194 | 17,735 | 55,574 | 50,625 |
| Ry. operating income | 95,268,416 | 96,948,039 | 49,181,627 | 49,799,945 | 6,775,720 | 7,027,999 | 12,292,154 | 12,503,702 | 27,018,915 | 27,616,393 |
| Equipm't rents—Dr. bal. | 7,436,442 | 6,904,374 | 4,307,294 | 4,262,772 | *d* 503,244 | *d* 630,108 | 601,446 | 1,156,336 | 3,030,946 | 2,115,374 |
| Joint facility rent—Dr. balance | 2,167,950 | 1,913,867 | 1,027,451 | 981,744 | 98,179 | 89,491 | 118,893 | 83,187 | 923,427 | 759,445 |
| Net railway operating income | 85,664,024 | 88,129,798 | 43,846,882 | 44,555,429 | 7,180,785 | 7,568,616 | 11,571,815 | 11,264,179 | 23,064,542 | 24,741,574 |
| Ratio of expenses to revenues (per cent) | 75.36 | 75.12 | 73.83 | 73.77 | 64.64 | 63.22 | 76.01 | 76.27 | 78.54 | 77.99 |

FOR FIVE MONTHS ENDED WITH MAY, 1927 AND 1926

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Average number of miles operated | 237,920.01 | 237,253.71 | 59,101.08 | 59,172.49 | 5,555.18 | 5,552.46 | 39,540.33 | 39,183.93 | 133,723.42 | 133,344.83 |
| Revenues: | | | | | | | | | | |
| Freight | 1,878,836,152 | 1,845,725,587 | 843,100,037 | 827,064,711 | 103,502,015 | 95,293,532 | 267,146,556 | 276,209,689 | 665,087,544 | 647,157,655 |
| Passenger | *c* 392,541,385 | *e* 412,417,708 | 197,316,435 | 201,137,415 | 8,633,405 | 9,105,784 | 56,827,191 | 68,623,989 | 129,764,354 | 133,550,520 |
| Mail | 39,308,721 | 39,681,663 | 14,944,486 | 14,977,443 | 1,030,688 | 1,063,674 | 5,883,847 | 5,989,144 | 17,449,700 | 17,651,402 |
| Express | 55,643,531 | 57,503,102 | 26,120,536 | 27,050,632 | 1,287,624 | 1,263,006 | 7,723,872 | 8,802,597 | 20,511,499 | 20,386,867 |
| All other transportat'n | 82,881,605 | 82,634,377 | 46,369,093 | 46,642,695 | 1,050,892 | 1,045,783 | 4,803,472 | 5,324,686 | 30,658,148 | 29,621,213 |
| Incidental | 49,788,040 | 49,828,722 | 25,374,474 | 25,136,263 | 2,014,458 | 1,938,828 | 6,066,473 | 7,214,317 | 16,332,635 | 15,539,314 |
| Joint facility—Cr. | 5,609,762 | 5,294,220 | 2,279,898 | 2,137,593 | 70,929 | 67,502 | 725,280 | 711,026 | 2,533,655 | 2,378,099 |
| Joint facility—Dr. | 2,051,537 | 1,889,308 | 675,542 | 663,207 | 11,568 | 10,747 | 165,252 | 167,380 | 1,199,175 | 1,047,974 |
| Ry. operat'g revenues | 2,502,557,659 | 2,491,196,071 | 1,154,829,417 | 1,143,483,545 | 117,578,443 | 109,767,362 | 349,011,439 | 372,708,068 | 881,138,360 | 865,237,096 |
| Expenses: | | | | | | | | | | |
| Maintenance of way and structures | 343,194,219 | 333,581,720 | 141,623,519 | 138,649,771 | 16,061,526 | 14,797,352 | 49,819,771 | 51,530,753 | 135,689,403 | 128,603,844 |
| Mainten'ce of equipm't | 518,777,377 | 534,912,607 | 248,920,709 | 257,133,541 | 25,127,036 | 24,616,108 | 68,232,828 | 71,039,086 | 176,496,804 | 182,123,872 |
| Traffic | 49,547,133 | 45,997,075 | 18,095,854 | 16,568,253 | 1,291,161 | 1,220,829 | 8,808,928 | 8,519,110 | 21,351,190 | 19,688,883 |
| Transportation | 909,641,699 | 902,778,365 | 435,202,198 | 428,045,733 | 31,150,024 | 30,277,076 | 123,768,814 | 131,605,534 | 319,520,663 | 312,850,022 |
| Miscellaneous operat'ns | 22,654,879 | 22,451,482 | 10,623,382 | 10,435,681 | 445,581 | 480,384 | 2,922,435 | 3,170,496 | 8,663,481 | 8,364,921 |
| General | 80,029,540 | 76,746,008 | 36,322,193 | 35,332,597 | 2,752,977 | 2,347,014 | 10,507,045 | 9,987,883 | 30,447,325 | 29,078,514 |
| Transportation for investment—Cr. | 5,350,562 | 5,456,407 | 995,877 | 636,451 | 139,080 | 126,415 | 718,026 | 1,094,765 | 3,497,579 | 3,598,776 |
| Ry. operat'g expenses | 1,918,494,285 | 1,911,010,850 | 889,791,978 | 885,529,125 | 76,689,225 | 73,612,348 | 263,341,795 | 274,758,097 | 688,671,287 | 677,111,280 |
| Net revenue from railway operations | 584,063,374 | 580,185,221 | 265,037,439 | 257,954,420 | 40,889,218 | 36,155,014 | 85,669,644 | 97,949,971 | 192,467,073 | 188,125,816 |
| Railway tax accruals | 152,391,581 | 150,259,785 | 61,577,316 | 60,748,185 | 8,910,690 | 7,619,142 | 20,939,391 | 21,791,396 | 60,964,184 | 60,101,062 |
| Uncollectible ry. rev's. | 647,846 | 716,543 | 261,118 | 371,865 | 20,586 | 17,658 | 99,837 | 77,866 | 266,305 | 249,154 |
| Ry. operating income | 431,023,947 | 429,208,893 | 203,199,005 | 196,834,370 | 31,957,942 | 28,518,214 | 64,630,416 | 76,080,709 | 131,236,584 | 127,775,600 |
| Equipm't rents—Dr. bal. | 35,403,976 | 31,872,707 | 19,863,102 | 17,993,598 | *d* 2,348,913 | *d* 3,203,997 | 4,254,874 | 8,053,911 | 13,634,913 | 9,029,195 |
| Joint facility rent—Dr. balance | 10,559,299 | 9,400,132 | 5,192,972 | 4,000,701 | 516,172 | 496,147 | 480,628 | 532,991 | 4,369,527 | 4,370,293 |
| Net railway operating income | 385,060,672 | 387,936,054 | 178,142,931 | 174,840,071 | 33,790,683 | 31,226,064 | 59,894,914 | 67,493,807 | 113,232,144 | 114,376,112 |
| Ratio of expenses to revenues (per cent) | 76.66 | 76.71 | 77.05 | 77.44 | 65.22 | 67.06 | 75.45 | 73.71 | 78.16 | 78.26 |

*a* Includes $3,236,055 sleeping and parlor car surcharge. *b* Includes $3,152,426 sleeping and parlor car surcharge. *c* Includes $16,064,557 sleeping and parlor car surcharge. *d* Deficit or other reverse item. *e* Includes $16,271,190 sleeping and parlor car surcharge.

*Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.*

# Traffic

The Southern Pacific has placed open-top observation cars in service on its Cascade line.

The Union Pacific, effective August 1, will move its Portland, Ore., ticket office from the consolidated ticket office to its own quarters at Washington street and Broadway.

The twentieth formal meeting of the Northwest Shippers' Advisory Board will be held at Valley City, N. D., on July 26. The reports of the various commodity committees will be presented and Charles Donnelly, president of the Northern Pacific, and C. T. Jaffray, president of the Minneapolis, St. Paul & Sault Ste. Marie, will address the meeting.

Railroads operating passenger service between Chicago and Denver, Colo., have reduced the running time from 27½ hours to 26 hours and 40 minutes. The roads participating in this are the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Chicago & North Western and the Union Pacific, and the Atchison, Topeka & Santa Fe.

Oral arguments were heard by the Interstate Commerce Commission on July 7 on the complaint filed by the Inland Waterways Corporation asking the commission to require the railroads to join the corporation in the establishment of joint through routes and through rates from Chicago to St. Paul and Minneapolis via Dubuque, Ia., and a barge line on the upper Mississippi river. The corporation asked that the rates be made 20 per cent under the rail rates.

The Long Island announces that its freight line from Bay Ridge, N. Y., in the southern part of Brooklyn (where cars are received by float from Greenville, N. J.) northward to the connection with the New York, New Haven & Hartford, is now wholly electrified and electrically propelled freight trains are run direct from Bay Ridge to Port Morris, (New York City) where trains are made up for points east on the New Haven road. The Long Island has bought 14 electric locomotives for this service. The electrification program on the Bay Ridge line has cost about $4,000,000, the length of main track electrified being about 85 miles.

### Freight Traffic in May

Freight carried by the Class I railroads in May amounted to 40,112,981,000 net ton-miles, the greatest for any May on record, according to reports compiled by the Bureau of Railway Economics. This was an increase of 279,810,000 net ton-miles or seven-tenths of one per cent, as compared with the corresponding month of last year, and an increase of 1.3 per cent over May, 1923.

The Eastern, Southern and Western districts showed almost uniform increases. The record for the first five months this year shows 195,507,238,000 net ton-miles, the greatest ever reported for that period, and an increase of 4.1 per cent over the best previous record (1926). The increase over 1923 was 4.3 per cent.

Railroads in the Eastern district reported an increase of 4.9 per cent in the first five months, as compared with the corresponding period the year before, but the Southern district reported a decrease of four-tenths of one per cent. In the Western district, an increase of 4.8 per cent was reported.

The average daily movement of freight cars in May was 30.2 miles per day, the highest average for that month ever attained since the compilation of these reports were started in 1917. This was an increase of two-fifths of a mile above that for May last year and an increase of 2.8 miles above the average for May, 1925. For the first five months this year, the average daily movement per car was 29.9 miles, the highest average for any corresponding period on record.

The average load per car in May was 26.9 tons, an increase of one-tenth of a ton, compared with the average for May, 1926, but the same as for May, 1925.

### Findings in Gulf Ports Rate Case Partly Reversed

The Interstate Commerce Commission on July 9 issued a report on further hearing reversing to some extent its previous findings on a complaint filed by the Galveston Commercial Association and related cases. The commission now finds that rates on petroleum and petroleum products in export and coastwise movement from southern Kansas, Oklahoma and Texas to Galveston and other Texas ports taking the same rates, and on grain and grain products in export and coastwise movement from a portion of southern Kansas defined in the report, the same as to New Orleans and other Louisiana ports, are not unduly prejudicial. The findings of the original report with respect to these commodities, in which the rates were found to be unduly preferential of New Orleans and prejudical to Galveston, were reversed and schedules filed by the railroads in purported compliance with the order with respect to them were cancelled.

Rates on a number of other commodities in export, import or coastwise movement from or to points in the Southwest to or from Galveston and other Texas ports taking the same rates were found unduly prejudicial to those ports and unduly preferential of New Orleans. Rates on export, import and coastwise traffic from or to points on the Texas & Pacific and Louisiana Railway & Navigation system to or from Texas ports, the same as to or from New Orleans, were found not unduly prejudicial and a similar finding was made as to rates on petroleum and petroleum products from points in north central Texas to New Orleans and Galveston and ports taking the same rates and the blending-in-transit provision at Gulf ports.

Six of the commissioners, including Commissioner Campbell who wrote the report, subscribed to separate opinions "concurring in part," and Commissioners Hall and Woodlock dissented.

# Equipment and Supplies

## Locomotives

The Erie contemplates buying two Diesel-electric locomotives.

The Chinese Government Railways are inquiring through the builders for 4 Pacific type and 8 Mikado type locomotives.

The Louisville, Henderson & St. Louis has ordered 1 Pacific type locomotive from the American Locomotive Company.

The South Manchurian is inquiring through the locomotive builders for 5 two-cylinder Mikado type locomotives, and asking for an alternate bid on 5 three-cylinder locomotives.

## Freight Cars

The Michigan Central has ordered two double-plow cars from the Rodger Ballast Car Company.

The Standard Oil Company of New Jersey contemplates buying 8 hopper bottom coal cars of 55 tons' capacity.

The Anglo-Chilean Consolidated Nitrate Corporation, Chile, is inquiring through the builders for 100 flat cars and 40 gondola cars.

The Canadian Pacific will build 2 special flat cars of 120 tons' capacity in its Angus shops. These cars are to be used for carrying transformers.

The Chicago & North Western has ordered 50 caboose car underframes from the Bettendorf Company. Inquiry for 25 underframes was reported in the *Railway Age* of June 25.

The Chicago, Rock Island & Pacific has ordered 100 composite gondola car bodies of 50 tons' capacity, from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of June 18.

## Passenger Cars

The Southern Pacific has ordered two business cars from the Pullman Car & Manufacturing Corporation.

The Chicago & Alton has ordered four 72-ft. mail, baggage and passenger gas-electric rail motor cars from the Electro-Motive Company.

The Gulf, Mobile & Northern has ordered one business car from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of June 18.

## Iron and Steel

THE LEHIGH VALLEY is inquiring for 200 tons of steel for various bridges.

THE NORFOLK & WESTERN has ordered 40,000 tons of rail from the United States Steel Corporation and 20,000 tons from the Bethlehem Steel Company.

## Machinery and Tools

THE LOUISVILLE & NASHVILLE has ordered a 90-in. standard driving wheel lathe, from the Niles-Bement-Pond Company.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for one triple head bolt cutter and one 16-in. motor-driven portable lathe.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered a 90-in. locomotive journal turning lathe and a 1,100-lb. steam hammer from the Niles-Bement-Pond Company.

## Miscellaneous

THE PENNSYLVANIA will receive bids until 12 o'clock noon, August 4, at Philadelphia, Pa., for frogs, switches, switch points, guard rails and paint.

## Signaling

THE CHICAGO & EASTERN ILLINOIS has ordered from the General Railway Signal Company nine intermittent inductive automanual train control engine equipments.

THE LONG ISLAND has had two mandamus suits in the Supreme Court of New York filed against it by the Transit Commission, seeking to make it comply with an order issued last December requiring equipment of crossings in Brooklyn and Queens and automatic warning signals of a horizontal flashing red type and a warning bell of an intermittent type. The petition of the Transit Commission alleges that although the railroad promised last December to comply with the order it has furnished lights and bells at only one of the 28 crossings in Queens, at street intersections with the main line and a number of its branches, and at only two of the 17 crossings of the Atlantic division of the road in Brooklyn and Queens. The Commission has asked the court to require the railroad to submit plans for these lights and signals within 20 days.

### A. T. C. on the Southern

The Southern has completed the installation of automatic train control on its lines from Chattanooga, Tenn., to New Orleans, La., 497 miles, except for 37 miles, and with this completed will have automatic train control in service from Cincinnati by way of Chattanooga, Atlanta and Macon to Jacksonville, Fla., 840 miles, and also by way of Chattanooga and Meridian, 835 miles. (The distance from Cincinnati to Chattanooga, 338 miles, is included in both of the foregoing totals). The installation from Salisbury, N. C., to Knoxville, Tenn., 270 miles, also has recently been put in service.

# *Supply Trade*

**W. W. Wixson,** representative of the **Bonney Forge & Tool Works,** Allentown, Pa., has been promoted to district sales manager of the central district.

**Charles F. Simpson** has been appointed district engineer for Tennessee, with office in the Cotton States building, Nashville, for the **Portland Cement Association.**

The **Curtain Supply Company** has awarded a contract for the construction of a one-story foundry addition at Elkhart, Ind., to the **Ralph Sollitt Construction Company.**

**Jules Gilmer Korner, Jr.,** chairman of the United States Board of Tax Appeals, has resigned to resume the general practice of law and to join the staff of **Charles Hansel** of Washington, D. C., and New York, consulting specialists for railroads, utilities and industrials.

**James W. Bancker,** controller of manufacture of the **Western Electric Company,** has been elected a director and vice-president in charge of purchasing and traffic, succeeding Jay B. Odell, deceased. Mr. Bancker has been connected with the company for 35 years, having entered its employ as an office boy at the age of fifteen. He was born in London, England, and in 1892, he went to work in the Western Electric's New York shops on Thames street. From that time until 1908 he filled positions of increasing importance

J. W. Bancker

in various departments of the company in New York. In 1908 he was transferred to the Hawthorne works at Chicago, returning to New York the following year as superintendent of the New York shop. From 1911 to 1923 Mr. Bancker served in Chicago, where he was assistant general superintendent of the Hawthorne works. In the latter year he returned to New York as assistant vice-president and in 1926 he was made controller of manufacture and president of the Manufacturers' Junction Railway Company.

**M. J. Harkless** has been appointed sales engineer of the contractors' department of the **Independent Pneumatic Tool Company,** Chicago. Mr. Harkless was previously an engineer of the railway and marine supply department of the Buda Company, Harvey, Ill.

The **Foote Brothers, Gear & Machine Company,** Chicago, has appointed the following sales agents: The **Briggs-Shaffner Company,** Winston-Salem, N. C.; the **Circle Corporation,** Tulsa, Okla.; and the **Houston Armature Works,** Houston, Texas. **G. W. Craighead** has been appointed district representative in eastern Michigan, with headquarters at Detroit, Mich.

A merger of the **Bucyrus Company,** South Milwaukee, Wis., and the **Erie Steam Shovel Company,** Erie, Pa., was approved by the directors of both companies on July 20. A third company will be organized and will take over the assets of the present companies. Holders of preferred stock in both companies will be given preferred stock in the new company, share for share. Holders of the common stock of the Erie company are to be given convertible preference stock of the new company, carrying a dividend of $2.50 per year, dependent upon the payment of dividends of $1 a year on the common stock. All the common stock of the new company will be taken over.

The **Power Specialty Company,** New York, and the **Wheeler Condenser & Engineering Company,** Carteret, N. J., have been consolidated, as have the subsidiaries of both companies and will be known in the future as the **Foster Wheeler Corporation.** No changes in products are contemplated, and no changes in management will be made. The officers of the new company are **J. J. Brown,** chairman of the board of directors; **Pell W. Foster,** vice-chairman and treasurer; **L. B. Nutting** president; **John Primose, H. S. Brown,** and **W. E. Dowd, Jr.,** vice-presidents; **David McCulloch,** secretary and general manager, and **W. F. Keenan, Jr.,** chief engineer.

## Trade Publications

THE R. H. BEAUMONT COMPANY, of Philadelphia, Pa., has recently issued a catalog, No. 95, devoted to the Beaumont cable drag scraper system for handling sand, gravel, stone and other bulk materials. Within this catalog, which includes many illustrations of installations and applications of the equipment, all of the units making up the system, including the drive and hoisting mechanisms, are fully described. Beaumont bin gates are also given a prominent place in the catalog, which, in addition, features the newly acquired Beaumont American slack line cableway.

# Construction

BALTIMORE & OHIO.—Plans are being made by this road, according to a statement by Daniel Willard, president, to aid in the construction of a community apple-packing plant for fruit growers at Martinsburg, W. Va. It is estimated that $75,000 would be involved in the building itself. The road plans to construct a 350-ton steel bridge on its line in Indiana, and has ordered the steel from the American Bridge Company.

CANADIAN NATIONAL.—Bids closed on July 21 for clearing the right-of-way, grading and construction of culverts on the Sturgis-Peesane branch, 79 miles, and on the Willowbrook Northwesterly branch, 22 miles, in Saskatchewan, and on the Bretona-Cloverbar cut-off, 11 miles, in Alberta. The bids asked for construction of the Sturgis-Peesane branch are in addition to the contract already awarded for the portion of the line between Sturgis and a point 21 miles north.

CANADIAN NATIONAL.—A contract for the construction of a line from a point near Spruce Lake, Sask., through Le Claire, Sask., to the North Saskatchewan river, 30 miles, has been let to Dutton & Mannix, Winnipeg, Man., at an approximate cost of $990,000. Stewart and Cameron, Ltd., Winnipeg, have been awarded a contract for the grading and construction of culverts for a line from Elk Point, Alta., east to the North Saskatchewan river, 19 miles, at an estimated cost of $745,000. The same contractor will grade and construct culverts for a line from a point east of Ashmont, Alta., east to Bonnyville, 38 miles. The total cost of this extension is estimated to be $1,415,000.

CANADIAN NATIONAL.—Tenders are now being invited for the construction of 7.9 miles of new line between Grand Mere, Shawinigan Falls and East Burrills, in the province of Quebec. The proposed branch would leave the present tracks of the Canadian National at Grand Mere and keep in the valley of the St. Maurice river, swing south of the present Canadian National line into the town of Shawinigan Falls, then head generally northwest and rejoin the present main line at East Burrills, about 2.5 miles west of Glenada station. The present line from Grand Mere to East Burrills and the spur Aldred to Shawinigan Falls would be abandoned. This branch will reduce the present grade westbound out of Grand Mere and give direct main line connection to the town of Shawinigan Falls.

CANADIAN PACIFIC.—A contract for the construction of a branch line between Foam Lake, Saskatchewan, and Duval, 75 miles, has been let to W. P. Dutton & Co., Winnipeg, Man.

CANADIAN PACIFIC.—A contract for the grading of the line extension from Rosetown, Sask., to Perdue, 31 miles, has been let to Dutton & Mannix, Winnipeg, Man. Pile trestle work on this extension and on the extensions from Maxstone, Sask., west 30 miles, and from Asquith, Sask., northwest 20 miles, will be done by Duff, Flint & Co., Winnipeg. A contract has been let to the J. McDiarmid Company, Winnipeg, for the construction of an immigration hall at Winnipeg, having outside dimensions of 56 ft. by 126 ft. The structure, which will serve as a general waiting room for immigrant passengers, will be two stories in height and will involve an expenditure of about $60,000.

CHESAPEAKE & OHIO.—The U. G. I. Contracting Company has been awarded a contract for the sub-structure of a new railroad bridge across the Ohio river between Cincinnati and Covington, O. This work is to cost $500,000 and includes, besides other work, the installation of several large piers in the Ohio river under 40 to 50 feet of water.

CHICAGO & NORTH WESTERN.—A contract has been let to S. G. Cool, Chicago, for the construction of a boiler house at the Chicago avenue terminal, Chicago, to cost about $30,000.

DELAWARE, LACKAWANNA & WESTERN.—This road has made plans for a new passenger station at Paterson, N. J., to cost around $100,000 and will close bids on this work August 1.

ERIE — PENNSYLVANIA.—These roads have made plans for the elimination of grade crossings on their lines at Akron, O.

FLORIDA EAST COAST.—The two overhead bridges being constructed by the State Highway department on this line, part of the expense of which is being borne by Florida East Coast, are to be located at Vero Beach and Olympia, Fla.

GREAT NORTHERN.—Plans have been announced by this company for the improvement of facilities at the Spokane, Wash., freight station, involving an expenditure of about $60,000. This will include the paving of an area in the vicinity of the freight station, replacing of wooden platforms with concrete platforms and rearrangement of a number of tracks.

LEHIGH VALLEY.—This road plans to let further contracts shortly for pier construction in connection with the Lehigh Valley-Pennsylvania Bridge over Newark Bay, a contract for a part of this work has already been let to Arthur McMullen and Company of New York. This road plans the construction of a number of small bridges on its line at different points in New Jersey.

MOUND CITY & EASTERN.—This company has applied to the Interstate Commerce Commission for authority to build a new line from Mound City to Leola, S. D., approximately 70 miles. Julius Rosholt, 615 Metropolitan Life Bldg., Minneapolis, Minn., is president of the company.

NEW YORK CENTRAL.—This road has postponed indefinitely the awarding of contracts for work on the Phillips Manor substation at Phillips Manor, N. Y., and on the new ferry bridges at Weehawken, N. J. Postponement is due to changes being made in the plans of the railroad for development on these points. The road expects to award a contract shortly for the construction, at Buffalo, N. Y., of a baggage sub-station, passenger station and garage for which bids closed July 12. Total cost of work involved in this project is around $3,000,000. A contract has been awarded to E. J. Doyle of New York for the construction of a station plaza at Hartsdale, N. Y. A contract has been let to the Campion Construction Company of Albany, N. Y., for paving work in the freight yard at Albany. The road has made plans for construction work on a power house at Buffalo.

PENNSYLVANIA.—This road plans the construction of a new passenger station at Lancaster, Pa., and is inquiring for 425 tons of steel for use in the structure.

READING.—This company plans to erect a new freight and passenger terminal at Lansing, Pa.

SAN BENITO & RIO GRANDE VALLEY.—A contract for the construction of line from Fernando, Tex., eastward 6 miles to the Gulf of Mexico has been let to the W. T. Montgomery Company, San Antonio, Tex. Another contract has been let to the W. H. Nichols Company, Dallas, Tex., for the construction of a line from San Benito, Tex., eastward 18 miles to Laguna Vista on the Gulf of Mexico.

SOUTHERN PACIFIC (Pacific lines)—Company forces are being employed in the construction incident to the changing of the gage of the Nevada-California-Oregon between Wendel, Cal., and Lakeview, Ore., 155 miles, from 3 ft. to standard gage.

SOUTHERN PACIFIC (Morgan's Louisiana & Texas).—This company has awarded a contract to the G. E. and E. E. Reiman Company, New Orleans, La., for the construction of a two-story reinforced concrete, brick and steel fruit warehouse on Front street at Julia street, New Orleans. The cost of the structure, which will include an office building attached to the warehouse, will be about $100,000.

TOLEDO & CINCINNATI.—This company has applied to the Interstate Commerce Commission for authority to construct an extension of 4.3 miles from Hamilton Furnace, in Butler county, Ohio.

WESTERN MARYLAND.—This road has made plans to double the capacity of its Port Covington coal pier, which includes the installation of a revolving car dumper. It has made plans for a viaduct at Hanover street in Baltimore. The road has under construction a line of second-track at Williamsport, W. Va. It also has under construction a line of second-track at Shippensburg, Pa., and double-track at Jerome, W. Va. It has in the course of construction additional yard tracks at Hagerstown, Md. The company has just completed replacement of two light bridges near Parsons, W. Va.

# Railway Finance

BALTIMORE & OHIO.—*Additional Stock Issue Authorized.*—The Interstate Commerce Commission on July 18 approved this company's application for authority to issue $63,242,500 of additional common stock to be sold at 107.50 to the holders of its preferred and common stocks and the proceeds to be used in making capitalizable expenditures or to reimburse the treasury for such expenditures. Referring to criticism of the terms of the issue by a minority stockholder, who had opposed the payment of an underwriting commission of $2.25 per share to Kuhn, Loeb & Co., and Speyer & Co., the report by Division 4 says that "while the necessity for underwriting in this case may be subject to question, we feel that on the facts shown we should accept the judgment of the applicant's management as to that."

Commissioner Eastman, in a concurring opinion said in part:

"There are really two questions: First, whether or not there should be any underwriting; and second, in the event of underwriting, whether or not a favored group of bankers should have been employed for the purpose without competitive bidding.

"In view of the fact that applicant's common stock has not commanded prices above par for a very long period of time and that the excess above par is not now very great, it seems clear that in the case of so large a new issue as is contemplated, it would not be safe to offer the shares to the stockholders without underwriting at so high a price as $107.50, and it is doubtful whether any amount in excess of par would be safe. From the standpoint of the public interest which demands, in general, that a railroad company obtain maximum prices for new securities, the plan proposed is, therefore, better than a plan which would contemplate distribution among the stockholders without underwriting. There still remains the question whether it would be wiser, in the long run, to give more profit to the stockholders and less profit to monopolistic bankers; but this, I am inclined to believe, is a question of discretion in management which, under the theory upon which private ownership of railroads rests, we ought not to undertake to decide. If the stockholders do not like the policies and practices of the management, they have, in theory at least, an adequate remedy.

"The second question is a more difficult one. I question seriously whether there is any sufficient reason why a railroad like the Baltimore & Ohio should give any group of bankers a monopoly of its financing. Nothing that I have observed or heard has convinced me that there is sufficient reason, and my opportunities in the past seven years for observation and for listening to arguments upon this point have been reasonably good. However, we have made a start in escaping from this dubious practice, for competitive bidding has now become the general rule in the case of equipment-trust certificates. This has been accomplished by the commission substantially without the help of stockholders or shippers or any other section of the interested public. Under the circumstances I have been content that we should proceed cautiously and slowly in this matter, making certain of our ground at each step. There are steps which have not been taken which would naturally precede competitive bidding on underwriting commissions. The situation being as it is I am not disposed at present to disapprove what was done here.

"These conclusions I have reached in this case with some considerable degree of hesitation. I am not abundantly confident that they are right. Similar questions seem likely to arise in other cases. It is much to be hoped that stockholders and others will take an active interest in these questions so that we may have the benefit of intelligent discussion from all points of view.

"There are two other matters which merit mention. It appears that it would not now be necessary for the applicant to sell so large an issue of new stock if it had not during the past year utilized so large a portion of its cash resources in the acquisition of Western Maryland stock and of an interest in Wheeling and Lake Erie stock."

BANGOR & AROOSTOOK.—*Increase in Stock Authorized.*—Stockholders, at a meeting in Bangor, Me., on July 19, approved the increase in the authorized capital stock from 77,200 shares to 112,200 shares. The increase amounts to 35,000 shares but only 29,300 will be issued at this time and will be offered to stockholders of record on July 19 at $60 a share for the $50 par value stock.

BUFFALO, ROCHESTER & PITTSBURGH.—The Public Service Commission of New York has directed the elimination of the Big Tree road crossing of this company's tracks in East Hamburg, Erie county, by carrying the highway over the tracks on a three-span bridge, the railroad company to prepare all plans, specifications and estimates for approval by the commission. This order takes the place of a former order abrogated by the commission so as to comply with changes in the grade crossing law in 1927.

CENTRAL VERMONT.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to sell $767,700 of 5 per cent refunding mortgage bonds which it owns and to draw down from the trustee and sell $1,394,000 of similar bonds, the proceeds to be used in partial payment of the company's indebtedness to the Canadian National Railways.

CHICAGO & WESTERN INDIANA.—*Tentative Valuation.*—The Interstate Commerce Commission has issued a tentative valuation report as of 1918 finding the final value for rate-making purposes of the property owned and used for common-carrier purposes to be $24,275,000. The value of the property owned was placed at $55,940,979 and that of the used property, excluding $31,665,970 for property leased to other roads, at $24,290,000. In a separate report the final value of the property used by the Belt Railway of Chicago was placed at $17,640,340, most of which was leased from the Western Indiana. The value of the owned property was placed at $500,000.

CHICAGO, MILWAUKEE & ST. PAUL.—*I. C. C. Hearing Concluded.*—The hearing on the application of the Chicago, Milwaukee, St. Paul & Pacific for authority to take over and operate the properties under the reorganization plan, before Director Mahaffie of the Bureau of Finance of the Interstate Commerce Commission, was concluded on July 19. Counsel for the Jameson bondholders' committee offered but one witness, Howard T. Page, certified public accountant, who filed a number of statements showing the market quotations and volume of sales of St. Paul securities since January 1, 1925, the net income available for the junior bonds, a comparison of maintenance costs of the St. Paul and other western railroads, the amounts of bonds of various classes, and the value of the equity of the refunding and Puget Sound bonds on the basis of an estimate of the valuation of the property.

By agreement between counsel for the applicant and the intervening committee, parts of the records of the hearings in connection with the commission's investigation of the affairs of the St. Paul and in connection with the court proceedings were stipulated into the record.

Counsel for the Jameson committee filed a statement showing that as of July 15 the committee represented $17,339,100 par value of bonds, held by 50 depositors.

Just before the close of the hearing Daniel H. Grady, assistant attorney general of Wisconsin, filed an appearance in the case and asked to have incorporated in the record testimony at the investigation hearings relating to the St. Paul's power contract with the Montana Power Company, saying that the minimum amount of power provided in the contract is so high as to involve the payment of an unjust rate for the power actually used and that it becomes material for the commission to determine whether the new company should be allowed to issue securities under the reorganization plan as long as that contract remains in effect. Robert Swaine of counsel for the railroad company said the applicant desired the utmost expedition possible and offered to have his brief ready in ten days, allowing ten days for a reply, and to have the case settled without oral argument, but Mr. Anderson asked for more time and for an argument, so 30 days was allowed for the applicant's brief, 20 days for the interveners' brief, including one for the state of Wisconsin, and 10 days for the applicant's reply. Director Mahaffie said that the argument could probably be heard between September 20 and 30. Mr. Swaine said that every day of delay costs the company about $2,000 in interest, representing the difference between the interest rate on the government debt and the rate on the bonds to be issued for new money.

CHICAGO, ROCK ISLAND & PACIFIC.—*Abandonment.*—This company has been authorized by the Interstate Commerce Commission to abandon part of a branch line from Reasnor, Ia., to Monroe, 7 miles.

COLORADO & SOUTHERN.—*Acquisition.*—This company and the Fort Worth & Denver City have applied to the Interstate Commerce Commission for authority to acquire control of the Fort Worth & Denver South Plains, organized in the interest of the Colorado & Southern which is building about 202 miles of new line in Texas, by purchase of its capital stock by the Colorado & Southern and by lease to the Fort Worth & Denver City for operation. The new company has also applied for authority to issue 2,000 shares of capital stock, of which 1,991 shares are to be sold at par for cash to the Colorado & Southern.

ERIE.—*Equipment Trust Securities.*—The Interstate Commerce Commission has authorized the issuance of $6,422,000 4½ per cent equipment trust certificates, series NN, to be sold to Drexel & Co., the highest of three bidders, at 98.68, giving an average annual cost to the railroad of approximately 4.69 per cent. The equipment includes 80 steam locomotives, 2 oil-electric locomotives and 54 passenger train cars, having a total approximate cost of $8,094,000. The sale of these securities by Drexel & Co. was reported in the *Railway Age* of July 9.

GREAT NORTHERN.—*Six Months' Report.*—In the annual report to stockholders

made public this week, President Ralph Budd gives an estimate of the earnings for the first six months of 1927 (figures for June estimated). The report shows a balance available for dividends of $3,400,000, equivalent to $1.36 a share on the company's preferred stock. The net income for the first six months of 1926 was $3,753,514 or $1.50 a share. Selected items from the income statement follow:

**Great Northern**

| | First six months | |
|---|---|---|
| | 1927 | 1926 |
| Revenue from freight transportation | $37,170,000 | $36,567,967 |
| Revenue from passenger transportation | 6,025,000 | 5,921,517 |
| Revenue from mail, express and other sources | 4,795,000 | 4,708,567 |
| Total railway operating revenues | $47,990,000 | $47,198,051 |
| Railway operating expenses | 36,665,000 | 36,007,001 |
| Net revenue from railway operations | $11,325,000 | $11,191,050 |
| Taxes | 4,635,000 | 4,474,092 |
| Equipment and joint facility rents (credit) | 230,000 | 305,984 |
| Net railway operating income | $6,920,000 | $7,022,942 |
| Other income | *5,920,000 | *5,832,835 |
| Total income | $12,840,000 | $12,855,777 |
| Interest and other deductions | †9,440,000 | †9,103,263 |
| Balance available for dividends | $3,400,000 | $3,753,514 |
| Net railway operating income for twelve months | ..... | $31,280,429 |

*Includes $4,150,900 dividend from C. B. & Q. stock.
†Includes $4,025,000 interest on bonds issued for purchase of C. B. & Q. Stock.

KANSAS CITY SOUTHERN.—*Merger Opposed.*—Interests headed by R. C. Duff, president of the Waco, Beaumont, Trinity & Sabine, opposing the organization of the new Loree southwestern system, have addressed a letter to L. F. Loree, chairman of the Kansas City Southern, insisting that in accordance with the Interstate Commerce Commission's decision disapproving Mr. Loree's plan, the Kansas City Southern and the St. Louis Southwestern should dispose of the stock of the Missouri-Kansas-Texas and relinquish control of that carrier. A statement issued by Mr. Duff, made public this week also states:

"Interveners refer to the fact that immediately after the report of the commission was handed down it was publicly announced that the chairman of the Kansas City Southern had conferences with President Coolidge and with the Interstate Commerce Commission, after which he was said to have announced the purpose of the Kansas City Southern to construct and return to the commission in about ten days with a new plan for the proposed consolidation. In this connection the interveners remark that the federal statutes do not vest the president with any function in regard to such matters, and that the commission does not undertake to deal with same in an informal way. The commission would not undertake to recommend to the Kansas City Southern the formation of a new plan, or to take any other course as the result of a private application without notice to other interested partes. The interveners take the position that no plan for consolidation that can now be devised, can do away with the fact that the existing unification of the properties was effected without reference to the commission, without regard for the interests of the public and without concern for its effect on various southwestern short line railroads. They claim that no plan, born out of such a situation, is likely to merit or receive the approval of the commission."

LONG ISLAND.—*Equipment Trust.*—The Interstate Commerce Commission has authorized an issue of $3,765,000 of equipment trust certificates to be sold at not less than 99,391.

LOUISVILLE & NASHVILLE.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate 7.54 miles of branch line in Kentucky by purchase from the Kentenia-Catron Corporation for $100,000.

MINNEAPOLIS & ST. LOUIS.—*Bonds.*—F. J. Lisman & Co. have sold $650,000 7 per cent bonds dated February 1, 1887, due June 1, 1927, and extended at 6 per cent to June 1, 1932. The price is 101½ and accrued interest, giving a yield of about 5.65 per cent. The amount of these bonds outstanding is $950,000 of which $300,000 have been extended by bondholders. The security is a first closed mortgage on 109 miles of line from Minneapolis to Albert Lea. Interest has been paid on these bonds for 50 years.

NEW YORK CENTRAL.—*Stock Issue.*—This company has applied to the Interstate Commerce Commission for authority to issue $38,325,000 par value of capital stock. Stockohlders would have the right to subscribe at par up to 10 per cent of their holdings of record at the close of business August 10, 1927. Any stock which may not be subscribed for under the proposed offer will be subject to sale at not less than par.

The applicant advised the Commission that it had provided last September for an increase in its authorized capital stock from $400,000,000 to $500,000,000, and this increase is about to be made effective by the filing of the necessary certificates thereof in the several states of incorporation. There is outstanding in the hands of the public $383,258,235 par value of the applicant's capital stock.

The basis of the present proposed issue is to reimburse applicant's treasury for uncapitalized expenditures from income totaling $77,360,713. As of July 1, 1927, total unexpended appropriations for capital expenditures upon the carrier's owned and leased lines (excluding the Boston & Albany Railroad) amounted to approximately $60,000,000. Unexpended appropriations for the purchase of new equipment as of that date amounted to approximately $15,940,000 and instalments of principal under equipment trusts maturing subsequent to July 1 up to and including January 1, 1928, amount to $3,989,440. The Commission was informed that the funds to be derived from the sale of the proposed additional stock are needed in order to enable the company to provide for these and other purposes.

NEW YORK, CHICAGO & ST. LOUIS.—*New Director.*—Alfred P. Sloan, Jr., president of the General Motors Corporation, has been elected a director.

NEW YORK, NEW HAVEN & HARTFORD.—*To Sell Stock.*—A special meeting of the stockholders will be held on August 17 to vote upon a proposal to issue 490,367 shares of 7 per cent cumulative preferred stock to be offered to present stockholders of the company at par on the basis of one share of preferred stock for each four shares of common now held and also to be offered to the holders of 6 per cent convertible debenture bonds maturing in 1948 in the proportion of one share of preferred stock for each $400 face value of debentures. The purpose of the issue is to pay off in part the company's indebtedness to the United States Government amounting to $87,030,000. The company's statement regarding the plan follows:

The directors have been considering a plan to finance and refund your company's indebtedness to the United States Government which amounts to $87,030,000 of which $60,000,000 falls due in 1930 and the remainder on and before October 31, 1935. Upon all of this debt your company is paying six per cent interest but has been given the option of paying off all or any part on any interest date.

In carrying out this plan the directors have authorized the calling of a special meeting of the stockholders to be held August 17, 1927, to consider and act upon a proposal to issue 490,367 shares of 7 per cent cumulative preferred stock of the par value of $100 per share. If the issue is authorized, each stockholder will have the privilege of subscribing at par for one share of preferred stock for every four shares of common standing in his name. A like privilege may also be exercised by each holder of the company's 6 per cent convertible debentures maturing in 1948 in the proportion of one share of preferred stock for each $400 face value of debentures. There are outstanding of these securities

| | |
|---|---|
| Capital stock | $157,117,900 |
| 6 per cent Debentures of 1948 | 39,029,000 |
| Total | $196,146,900 |

An issue of preferred stock on the above basis will amount to $49,036,700, at par.

The plan provides for the issue of negotiable warrants entitling the holder to subscribe on or before October 1, 1927, for the number of shares stated in such warrant, also for the issue of fractional warrants for holdings, the par of which is not a multiple of $400. These fractional warrants by combination with other fractional warrants will give the holder the right to subscribe for the shares indicated by the combination, but nothing less than full shares will be issued.

Subscribers may have the option of paying on or before October 1, 1927, for 25 per cent, 50 per cent, 75 per cent, or 100 per cent, of the subscription and will receive therefor the company's negotiable receipt showing the amount paid and entitling the holder thereof upon payment of the entire subscription price to receive the shares of preferred stock therein indicated and in the meantime to receive interest at the rate of 7 per cent per annum, payable semi-annually, on April 1, 1928, October 7, 1928, and April 1, 1929. Payments of not less than 25 per cent of the subscription must be made on October 1, 1927. Subsequent payment dates for not less than a like percentage will be April 1, 1928, October 1, 1928, and April 1, 1929.

It is the belief of your directors that by applying the proceeds of the preferred stock issue to reduce the $87,030,000 of debt to the government, the company will be able to refund the balance at a satisfactory rate of interest.

THREE DESIRED RESULTS

The plan if carried out will produce three desirable results:

(1) The company's financial structure will be improved, the proportion of stock to bonds being changed from the present one-third stock and two-thirds bonds to more than 43 per cent of stock and less than 57 per cent of bonds.

(2) This improvement should help the company's credit and so assist it in refunding the remainder of the debt at a lower rate of interest, making a considerable saving to the company.

(3) The stockholders will be given an opportunity to make a 7 per cent investment or to sell their rights to subscribe.

The preferred stock will be preferred in liquidation to the common stock and will be entitled to cumulative dividends at the rate of 7 per cent per annum. The holders are to have the option of converting such stock par for par into common stock. The company reserves the right to redeem and pay off the preferred stock on any dividend date at $115 per share upon 60 days' notice, but if so called for redemption the holders are to retain their right of conversion to the common stock until the date of redemption. The dividend requirement will amount to $3,432,000 annually, but will be offset by a reduction of interest charges of $2,942,000 per annum, making a net increase of payments out of the company's net income of only $490,000 per annum. In 1925 your company would have had $11,337,000 to meet the dividend requirement of $3,432,000; in 1926 your company would have had $11,185,000,—in each year more than three and one-quarter times the amount thereof.

In the years succeeding Federal control, the property has proved its earning power. This has been accomplished by an increase of operating revenues of $11,553,526, a decrease of operating expenses of $26,806,122 and a lowering of the operating ratio of 102.29 per cent in 1920 to 73.70 per cent in 1926, resulting in a net income

in 1925 of $8,395,000 and in 1926 of $8,243,000. During the same period the company has expended more than $40,000,000 on additions and improvements to the roadway and equipment, thus enlarging the transportation capacity of the property and enabling the management satisfactorily to handle a larger volume of traffic at a lower cost.

NOW HAS PROFIT AND LOSS SURPLUS

The balance sheet of your company now shows a profit and loss surplus and also a corporate surplus. The change from the corporate deficit of December 31, 1926, is due to current year's net income; transfer, with the approval of the Interstate Commerce Commission, of the profit on exchange of some 3½ per cent convertible debentures of 1956; and to the merger of the Central New England Railway Company.

After 1935 the company has no maturities of consequence until 1940, when what is left unpaid by the sinking fund of the secured gold 6 per cent bonds of 1940 will come due. It is expected that about half of the $23,000,000, the amount of that issue, will be paid off by 1940. After that the company will have no maturities of substantial amount until 1945.

The plan contemplates an underwriting of the preferred stock issue.

OHIO RIVER & WESTERN.—*Abandonment.*—Examiner Thomas F. Sullivan has submitted to the Interstate Commerce Commission a proposed report recommending a finding by the commission approving the abandonment of this company's line, from Bellaire to Zanesville, Ohio, 110 miles on condition that any part of it be sold at not less than the net fair salvage value to any one desiring to purchase it for continued operation. It is stated that the line has long been operated at a deficit and that not a single town or village served by it has protested the proposed abandonment.

PERE MARQUETTE.—*Stock Dividend.*—No opposition appeared at the hearing on this company's application for authority to issue $9,009,200 of additional common stock as a 20 per cent stock dividend before Examiner Devoe of the Interstate Commerce Commission on July 15. C. S. Sikes, vice-president and general auditor, filed for the record statements regarding the company's financial condition and earnings, saying that the new stock will capitalize approximately half of the company's corporate surplus of about $22,000,000 as of February 28,

PHILADELPHIA & CAMDEN FERRY COMPANY.—*Decrease in Stock.*—At a special meeting of the stockholders on July 13, action was taken authorizing a decrease in the total authorized capital stock of the company from $1,600,000 to $984,375, by a reduction of the number of shares from 40,000 to 39,375, and the reduction of the par value per share from $40 to $25 by the payment in cash of $15 per share to the stockholders.

SEABOARD AIR LINE.—*Equipment Trust Certificates.*—The Interstate Commerce Commission has authorized the issuance of $850,000 prior lien 4½ per cent equipment trust securities, series AA, to be sold to Dillon, Read & Co., the highest of three bidders, at 97.6, giving an average annual cost to the carrier of 4.895 per cent, and also $152,500 deferred equipment trust certificates, series AA, which will not be entitled to dividends and which will be taken by the carrier at par. The equipment includes 25 six-wheel switching locomotives purchased at a cost of approximately $1,002,500.

SOUTHERN PACIFIC.—*Equipment Trust.*—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of $5,786,000 of equipment trust certificates, to be sold at not less than 99.52.

TEXAS & PACIFIC.—*Acquisition of Pecos Valley Southern.*—The Interstate Commerce Commission has authorized the Texas & Pacific to acquire control by purchase of capital stock of the Pecos Valley Southern which operates a line from Pecos to Toyahvale, 40.4 miles, in Reeves County, Tex.

UNION PACIFIC.—*Tentative Valuation.*—A final value for rate-making purposes of $242,064,968 is placed on the used property of the Union Pacific Railroad, as of June 30, 1919, in a tentative valuation report issued by the Interstate Commerce Commission. The property owned by the carrier is value at $242,426,352, and the wholly owned and used property at $241,000,000. The cost of reproduction, new, of the used property is estimated at $237,565,156 and cost of reproduction, less depreciation, at $188,786,405.

The Union Pacific's capitalization, on date of valuation, is reported as $534,428,250. The investment in road and equipment including land, on that date, is stated in its books as $331,860,798.46. With readjustments required by the Commission's accounting examination, this amount would be reduced to $331,539,063.35. The Union Pacific owns and holds for non-carrier purposes $357,807,048.59 and £3,000,000 par value of securities of and other investments in other companies, which are recorded in its accounts at $355,113,823.38, book value.

## Average Price of Stocks and Bonds

| | July 19 | Last week | Last year |
|---|---|---|---|
| Average price of 20 representative railway stocks.. | 117.31 | 115.39 | 96.36 |
| Average price of 20 representative railway bonds.. | 94.01 | 93.63 | 90.88 |

## Dividends Declared

American Railway Express.—$1.50, quarterly, payable September 30 to holders of record September 15.

Gulf, Mobile & Northern.—Preferred, $1.50, quarterly, payable October 1 to holders of record September 15.

Hudson & Manhattan.—Preferred, 2½ per cent, semi-annually, payable August 15 to holders of record August 2.

Nashville, Chattanooga & St. Louis.—3½ per cent, semi-annually, payable August 1 to holders of record July 23.

## Valuation Reports

The Interstate Commerce Commission has issued final or tentative valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows:

| | | |
|---|---|---|
| FINAL REPORTS | | |
| Atlantic City & Shore | $386,181 | 1916 |
| Lake Tahoe Railway & Transportation Co. | 365,453 | 1917 |
| TENTATIVE REPORTS | | |
| Chicago & Western Indiana | $24,275,000 | 1918 |
| Belt Railway of Chicago | 17,640,00 | 1918 |
| Arkansas & Memphis Railway Bridge & Terminal Co. | 4,793,000 | 1918 |
| Chicago River & Indiana | 2,120,000 | 1919 |
| Hartford & New York Transportation Co. | 1,731,168 | 1918 |
| Indiana Harbor Belt | 6,700,000 | 1917 |
| Kansas City, Mexico & Orient | 6,146,500 | 1919 |
| K. C. M. & O., of Texas | 6,744,673 | 1919 |
| Minnesota Transfer | 4,260,000 | 1919 |
| Kentucky & Indiana Terminal | 4,050,000 | 1917 |
| Philadelphia, Bethlehem & New England | 1,815,000 | 1917 |
| Richmond Belt | 390,000 | 1916 |

# *Officers*

## Executive

**J. W. Wassum,** who has been appointed assistant to vice-president of the Southern, with headquarters at Columbia, S. C., was born in Wythe County, Va. In 1890 he was employed as conductor and yardmaster on the Norfolk & Western and in 1902 was employed as terminal trainmaster of the Seaboard Air Line, at Savannah Ga. He was transferred to a similar position on the same road at Portsmouth, Va., in 1906, and was then transferred back to Savannah in the same capacity in January, 1907. Mr. Wassum was transferred to the Sixth division in April, 1907, and the following month left the service of the

J. W. Wassum

Seaboard Air Line, to become superintendent of terminals on the Southern at Spencer, N. C. In 1908, he was transferred in the same capacity on the same road to Birmingham, Ala., and in 1910 became superintendent of the Charleston division at Charleston, S. C. Mr. Wassum became superintendent of the Spartanburg division in 1911, superintendent of the Columbia division at Columbia, S. C., in 1913, and superintendent of the Charlotte division at Greenville, S. C., in 1916. On March 1, 1920, he was appointed general superintendent of the Southern district at Birmingham, Ala., and in December of the same year, general superintendent of the Southeastern district at Macon, Ga. In October, 1924, he became general superintendent of the Eastern district at Charlotte, N. C., which position he was holding at the time of his recent appointment as assistant to vice-president.

**B. O. Johnson,** assistant to the vice-president in charge of operation of the Northern Pacific, with headquarters at St. Paul, Minn., has been promoted to assistant to the president, with headquarters at the same point, succeeding **Roy W. Clark,** promoted to general

traffic manager. **W. C. Sloan,** superintendent of the Lake Superior division, with headquarters at Duluth, Minn., has been promoted to succeed Mr. Johnson. Mr. Johnson was born on May 25, 1878, at Winchester, Mass. After graduation from Worcester Polytechnic Institute in 1900 he immediately entered the service of the N. P. as a track laborer and with the exception of a year on the Atchison, Topeka & Santa Fe remained continuously in the service of that railroad ever since. During 1901 and 1902 Mr. Johnson occupied various minor posts in the engineering department and in 1903 he was promoted to roadmaster. During 1905 he served as roadmaster on the Santa Fe, returning to the N. P. in 1906 as a trainmaster. In 1909 he was promoted to superintendent of the Yellowstone division, later being transferred to the Fargo and Montana divisions. Mr. Johnson joined the Russia Railway Service Corps in 1917 as a major. He served for 5½ years in Russia receiving the rank of lieutenant colonel and then colonel. He was decorated for this service by the French, Czecho Slovakian, Chinese and Japanese governments. Mr. Johnson became assistant to the vice-president in charge of operation in April, 1923, a position he held until his appointment as assistant to the president on July 16.

B. O. Johnson

## Financial, Legal and Accounting

**H. T. Foster** has been appointed auditor and traffic manager of the Laramie, North Park & Western, in addition to his present duties of assistant secretary and assistant treasurer, with headquarters as before at Laramie, Wyo., succeeding **Ernest Carter,** resigned.

## Operating

**Walter Buckner** has been appointed general manager of the Gulf department of the American Railway Express Company, with headquarters at Atlanta, Ga., succeeding **W. S. McFarland,** deceased.

## Traffic

**H. R. Smith** has been appointed assistant general freight agent of the Missouri-Kansas-Texas Railroad, with headquarters at St. Louis, Mo.

**A. J. Lehmann,** general freight agent of the St. Louis Southwestern, with headquarters at St. Louis, Mo., **R. P. Harrington,** assistant general freight agent, with headquarters at Little Rock, Ark., and **W. F. Knobeloch** have been promoted to assistant freight traffic managers, with headquarters at St. Louis.

**J. W. Brady,** general agent for the New York, Chicago & St. Louis, at Detroit, Mich., has been transferred to Pittsburgh, Pa., to represent the Nickel Plate-Clover Leaf districts, succeeding **A. B. Bierdeman,** who has been transferred to succeed Mr. Brady at Detroit, and **J. J. Lynch,** who has been appointed as a special agent in the traffic department of the Nickel Plate-Clover Leaf districts, with headquarters at Pittsburgh.

**Roy W. Clark,** assistant to the president of the Northern Pacific, with headquarters at St. Paul, Minn., has been promoted to general traffic manager, with headquarters at the same point, a newly created position. Mr. Clark, who was born at Petoskey, Mich., on October 4, 1880, has completed 25 years of service with the Northern Pacific, having entered the engineering department of that railroad as a stenographer in the office of the chief engineer on March 13, 1902. In January, 1903, he was transferred to the president's office where he served as a stenographer and as chief clerk until August, 1907, when he was advanced to secretary to the president. Mr. Clark was appointed assistant to the general manager of the Northern Pacific under the United States Railroad Administration in July, 1918, becoming assistant to the president on March 1, 1920, a position he held until his further promotion to general traffic manager, on July 16.

R. W. Clark

**George E. Boulineau,** who has been appointed freight traffic manager of the Atlanta & West Point, the Western Railway of Alabama and the Georgia Railroad, with headquarters at Atlanta, Ga., was born on May 11, 1884, at Augusta, Ga., and was educated at Charleston (S. C.) High School. He entered railway service on November 1, 1902, as stenographer and clerk in the traffic department of the Central of Georgia at Augusta, Ga. From January, 1904, until May, 1905, he was stenographer and rate clerk in the traffic department of the Southern at Augusta, and from the latter date until February 29, 1916, was secretary to the general freight agent, executive clerk, chief rate clerk and chief clerk on the Georgia Railroad at Augusta. From March 1, 1916, until July 1, 1918, he was assistant general freight agent for the same road at the same place, and from the latter date until October 15, 1918, was assistant general freight agent of the Georgia Railroad, the Atlanta & West Point, the Atlanta, Birmingham & Atlantic and other lines consolidated under Federal Manager E. T. Lamb. On October 15, 1918, Mr. Boulineau became assistant staff officer, traffic, Southern region, United States Railroad Administration at Atlanta, Ga. This position he held until March 1, 1920, when he was appointed general freight agent of the Atlanta & West Point, the Western Railway of Alabama and the Georgia Railroad. Mr. Boulineau has also served in the same capacity on the Tuskegee Railroad.

G. E. Boulineau

**Charles E. Rodenberg,** who has been appointed general freight agent of the Atlanta & West Point, the Western Railway of Alabama and the Georgia Railroad, with headquarters at Atlanta, Ga., was born on August 6, 1881, at Richmond, Ind., and was educated at the Mississippi A. & M. College, 1895-1896. He entered railway service in 1897, and until 1900 was with the Alabama Great Southern. From 1900 until the present time (except during the period of the World War) he has been with the Atlanta & West Point, of which road he was assistant general freight agent until the time of his

recent appointment as general freight agent.

## Mechanical

**C. A. Fisher,** fuel supervisor on the Great Northern, with headquarters at Hillyard, Wash., has been promoted to master mechanic, with headquarters at Grand Forks, N. D.

**F. E. Boehm** has been appointed road foreman of engines of the Fort Wayne division of the Western region of the Pennsylvania, with headquarters at Fort Wayne, Ind., succeeding **E. A. Burchiel,** promoted to trainmaster.

**W. E. Harmison,** master mechanic on the Western district of the Erie, with headquarter at Kent, O., has been transferred in the same capacity to Port Jervis, N. Y., and is in charge of mechanical work on the Delaware & Wyoming divisions.

**L. K. Sillcox,** general superintendent of motive power of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has requested and been granted a leave of absence of two months. All officers and employees in the locomotive department will report to **R. W. Anderson,** superintendent of motive power of the Eastern lines, with headquarters at Milwaukee, Wis., and those in the car department will report to **K. F. Nystrom,** until this time engineer of motive power and rolling

K. F. Nystrom

stock, with headquarters at Chicago, and is now promoted to master car builder, with headquarters at Milwaukee, succeeding **C. G. Juneau,** deceased. The position of engineer of motive power and rolling stock has been abolished. Mr. Nystrom was born in September, 1881, in Sweden, graduating from a Swedish university in 1904 as a mechanical engineer. Soon after coming to the United States in November, 1905, Mr. Nystrom entered the service of the Pressed Steel Car Company as a draftsman, where he remained until February, 1909, when he joined the engineering staff of the Pullman Company. In September of the same year he entered the mechanical department of the Southern Pacific, becoming assistant mechanical engineer of the American Car & Foundry Company in June, 1911, and mechanical engineer of the Acme Supply Company, Chicago, in July, 1912. Mr. Nystrom returned to railway service in September, 1913, when he was appointed chief draftsman of the car department of the Grand Trunk, with headquarters at Montreal, Que., remaining in that position until November, 1918, when he was appointed to a similar post on the Canadian Pacific. In January, 1920, he returned to the Grand Trunk as engineer of car construction. Mr. Nystrom's connection with the Milwaukee began in January, 1922, when he was appointed engineer of car design. He was promoted to engineer of motive power and rolling stock in January, 1925, with headquarters at Chicago, a position he held continuously until his promotion to master car builder on July 9.

## Engineering, Maintenance of Way and Signaling

**S. F. Grear,** office engineer of the Illinois Central, with headquarters at Chicago, has been appointed assistant engineer of bridges and buildings, with headquarters at the same point, succeeding **Charles Chandler,** who resigned to enter the service of the J. G. Brill Company, Philadelphia, Pa.

**C. M. Cannon,** division engineer of the South Florida division of the Seaboard Air Line, with headquarters at Arcadia, Fla., has been appointed district engineer maintenance of way of the Southern district, with the same headquarters, succeeding **J. W. Sexton,** transferred to the transportation department of the North Carolina division. **G. C. Ruskell** has been appointed division engineer of the South Florida division, with headquarters at Arcadia, succeeding Mr. Cannon.

**E. Bennett,** roadmaster of the New Orleans & Northeastern and the New Orleans Terminal Company (parts of the Southern), with headquarters at Hattiesburg, Miss., has been appointed engineer maintenance of way of the Southern lines West, with headquarters at Macon, Ga., with jurisdiction over the Atlanta division, the Georgia, Southern & Florida and the St. Johns River Terminal, succeeding **J. S. Sharp,** resigned. **C. R. Gates,** track supervisor, on the Southern, lines West, with headquarters at Birmingham, Ala., has succeeded Mr. Bennett.

## Purchases and Stores

**W. L. Burke,** commercial agent on the Chicago & Eastern Illinois at St. Louis, Mo., has been promoted to general agent, with headquarters at Buffalo, N. Y., succeeding **Russell Houston,** who has been transferred to Louisville, Ky. **C. W. Thacker,** general agent at Louisville, has been transferred to Indianapolis, Ind., where a new traffic office has been opened.

**John H. Nichols,** general storekeeper of the Nickel Plate district of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to general storekeeper of the entire system, with headquarters at the same point. The jurisdiction of **R. Stewart,** storekeeper in charge of bridge, building and roadway material of the Lake Erie and Western district has been extended to cover the Clover Leaf district, with headquarters at Frankfort, Ind.

## Obituary

**Garrett Townsend,** president of the Middletown & Unionville, with headquarters at Middletown, N. Y., died at his home there on July 15.

**W. S. McFarland,** general manager of the Gulf department of the American Railway Express Company, died at his home in Atlanta, Ga., on July 5, after an illness of several months.

**J. D. Keiley,** division engineer of the Chesapeake & Ohio, with headquarters at Clifton Forge, Va., was killed on July 8, when a track motor car in which he was riding was struck by an express train at Fordwick.

**Thomas W. Burke,** trainmaster of the Tennessee Central, and **R. L. Mauk,** master mechanic, both with headquarters at Nashville, Tenn., were killed near Ringgold, Tenn., on July 17, as the result of an accident which occurred while they were supervising the clearing up of a wreck.

**Wilmot K. Morley,** superintendent of a number of different railroads in the Mississippi Valley during the period from 1888 to 1903 and since 1918 president of the Grand Rapids, Grand Haven & Muskegon, an electric railroad in Michigan, died at Grand Rapids, Mich., on July 13, after an extended illness, at the age of 78 years. Mr. Morley was born at Youngstown, O., and entered railway service in 1867 as a station agent and telegraph operator on the Chicago & Alton at Murrayville, Ill. He served successively in this capacity and as train dispatcher, chief dispatcher and superintendent of telegraph until September 1, 1888, when he was promoted to superintendent of the St. Louis division, later acting as superintendent of the Kansas City division. From 1893 to 1898 Mr. Morley was general superintendent of the Kansas City, Pittsburg & Gulf (now a part of the Kansas City Southern) and from that time until January 1, 1901, he acted as superintendent of the Louisville, Evansville & St. Louis (now a part of the Southern). Following a period of two years as superintendent of the St. Louis-Louisville lines of the Southern, with headquarters at Louisville, Ky., Mr. Morley was elected vice-president and general manager of the Grand Rapids, Grand Haven & Muskegon on February 1, 1903. He became president and general manager of the same company on September 13, 1918.

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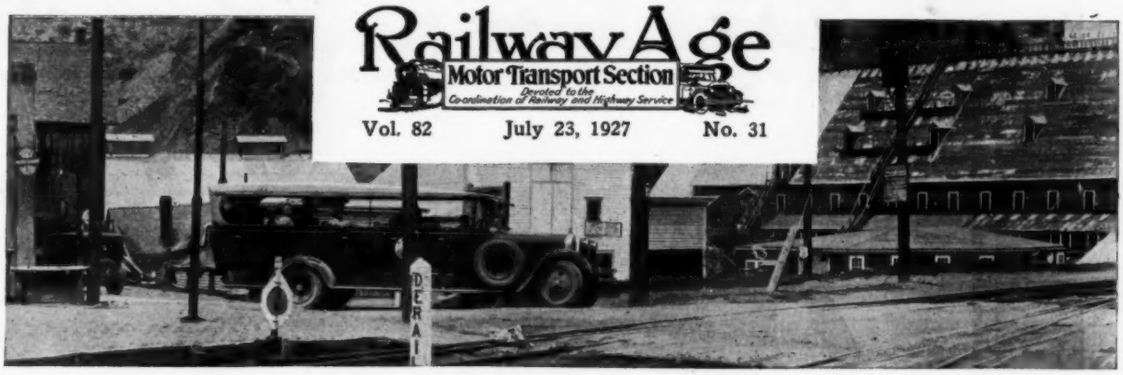


*White Bus in Service of President Coolidge's Party at Lead, S. D*

# Contents



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Motor Transport Section
Devoted to the Co-ordination of Railway and Highway Service

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## Many New Developments in The Month's News

EVERY month, it seems, finds the list of new developments in the field of railway motor transport growing. The past month has been no exception. One of the most interesting items concerns the Seaboard Air Line. A certificate has been granted the Seaboard by the Corporation Commission of North Carolina permitting the operation of a motor bus line by the railway between Rutherfordton, N. C., and Lake Lure, Chimney Rock, Bat Cave, and other points. This will be the first Seaboard bus line and the first railway bus route in the state of North Carolina. In the west, the Oregon-Washington Railway & Navigation Company, through a subsidiary, the Union Pacific Stages, began the operation of its Portland, Ore.,-Pendleton bus line on July 1. Five buses make two round trips daily over this 200-mile route. This is the second Oregon-Washington bus line, the first, between Pendleton, Ore., and Walla Walla, Wash., having been in operation for nearly two years. Several bus line certificates have been acquired by the Reading in the name of its passenger traffic manager and the lines are now in regular operation. The Atchison, Topeka & Santa Fe, through the Fred Harvey Company, which operates its other buses, has been granted a certificate to operate a bus line supplementing the railway service between Williams, Ariz., and the Grand Canyon. Steady expansion in railway operation of motor trucks is also notable. In New York City, the Pennsylvania has established two inland stations and a constructive freight station, and has awarded a contract for tractor and trailer service to these stations. Approximately 16 tractors and 64 trailers are being operated for this purpose. The New York Central, which is the largest railway user of trucks, now has more than 100 contracts for trucking service handling l. c. l. freight and uses more than 1,500 trucks, tractors and trailers. It appears that forecasts of general adoption of motor transport by the railways were justified.

## Drivers' Uniforms an Important Factor

IT is worth noting that almost without exception the officers in charge of the principal railway bus operating companies favor strongly the requirement that their bus drivers wear standard uniforms of attractive material and design. The views on this subject held by a number of them are related in the article entitled "Uniforms Better Drivers' Performance", which is published in this issue of the *Motor Transport Section*. Independent bus operators found long ago that they derive a substantial benefit from having their drivers well uniformed, and railway officers in charge of bus operations also are finding this true. It is significant that virtually all the officers quoted in the article in this issue mention the fact that neat appearing uniforms on their drivers have the effect of causing the drivers to do their work better. In other words slovenly attire means slovenly work, while good uniforms mean good work. In addition to this it is recognized that well uniformed bus drivers attract patronage to the buses. As one officer expresses it, "The appearance of the driver has a grea deal to do with the confidence of the public in his ability as a driver." The selection of the best type of uniform for bus drivers is at the present time largely a matter of cut-and-try. The Northland, for example, has changed the design and material of its drivers' uniforms four times. With the advantages of better driver performance and increased patronage to be had, however, any reasonable outlay in time and money on the part of a bus line management in the selection of the best uniform for its drivers should be well repaid.

## The Motor Vehicle on the South African Railways

IN South Africa there has been a rapid growth of railway-operated highway motor transport lines. Figures to bear this out are given in the June issue of the South African Railways & Harbors Magazine. At the end of May this year, the railways had 5,000 route miles of highway lines as against only 500 miles two years ago. The Magazine states that "there is reason to think that a high rate of increase will be maintained for some time to come." The highway lines in South Africa are for the most part "feeders" to the railway, rather than a substitute service. By means of such lines points as far as 250 miles from a rail line are being given regular common-carrier service. Most of the business done by these lines is in the conveyance of small agricultural produce and domestic articles. However, passengers are also carried and a special body, known as the "Bushveld", has been developed which has space for European passengers, native passengers and freight. The highway service is said to be highly popular with farmers who are now enabled to make some money out of dairy products, poultry, vegetables, etc., instead of depending on one crop alone—it not being possible for the farmer to run to market in his own vehicle every day or so with a few dozen eggs when the market is 100 miles away. The South African Railways' motor lines cover many routes where roads are unimproved. For this reason, and because of the nature of the traffic, most vehicles used are rather light, 2 or 2½ tons, and many are of the six-

wheel type. Mileage made per vehicle is not excessive—between 300 and 400 miles a week on the average. In February, 1927, total vehicle mileage was 130,410. The motor vehicle is thus proving itself a valuable adjunct to the railways in a country where population is as yet insufficient to support a high ratio of railroad mileage per unit of area. There are many other territories in the world in similar process of development which could doubtless benefit from an examination of South Africa's accomplishment to see whether methods successful there could not be more generally applied.

## *Joint Officers of Railways and Bus and Truck Subsidiaries*

THE New England Transportation Company is an example of railway and highway co-ordination extending not only throughout its operations, but even to its official personnel. Its experience has indicated that railway officers are entirely capable of supervising the operations of a bus or truck subsidiary and that the placing of men with automotive experience in charge of such operations is not strictly essential. All of the executives of the N. E. T. Company and a number of its operating officers of higher rank are either now, or were formerly, officers of the New Haven. It is true that, in appointing non-railway officers to certain of its most responsible positions, the N. E. T. Co. has recognized that in some cases railway experience is not so essential as experience in the operation of motor vehicles, and this recognition is wise. On the other hand, the officers are largely New Haven men, whose acquaintance with other officers of the railway and knowledge of railway operation facilitate the work of co-ordinating bus service with train service, for which purpose the New England company was organized.

## *Annual Reports Discuss Motor Transport*

NOT all railroads which operate highway vehicles review these operations in their annual reports. This is probably natural in view of the fact that on many of them, highway operations as yet do not bulk large in comparison to rail transportation. On the other hand, it seems from a perusal of a few railroad annual reports which do cover this phase of corporate activity, that the information is most valuable to the stockholders and the student of railway motor transport alike. For instance, the Denver & Rio Grande Western in its report for 1926, extracts from which appear on another page in this issue, tells of two operations started within this year, one of which earned 13.47 per cent on the capital stock and the other 3.2 per cent. Reasons for entering the highway transportation field are given by several roads and the reader will see that there is a considerable variety. Altogether information of this character is valuable and, as motor transport grows in importance as a railroad activity, doubtless more roads will analyze their experience with it in their annual reports. The making officially available to others by the railroads of the lessons from their own experience reflects an attitude of mutual helpfulness which is necessary to an early and satisfactory solution of the motor transport problem viewed from a railroad standpoint.

# Superintendent's Report on Motor Transport

TAKING as its task the presentation of information as to the manner in which "good service" is being given by the railways by the operation of motor buses and trucks as auxiliaries to their rail service, the special committee on motor bus and truck operation of the American Association of Railroad Superintendents presented a report at its recent convention at San Francisco, Cal., which is one of the most complete pictures of the place in the transportation field occupied by motor transport that a committee of railway officers has ever presented.

The allusion to "good service" is made in this year's report in citing the report of the same committee at last year's convention which gave the answer, "good service," to the question of how to meet motor bus and motor truck competition.

The report of the committee, which is abstracted in this issue of the Motor Transport Section, gives a thorough outline of the uses to which railways are putting buses and trucks and likewise the uses to which buses and trucks are being put by competitors of the railways. In connection with the latter, it quotes at length from the report of a committee of the American Railway Engineering Association which presented an exhaustive study of the effect of bus and truck operation on railway branch lines at the convention of that association in Chicago last March. Regulation and taxation of bus and truck lines are also discussed.

It is in the conclusions of the committee, however, that the real interest in the report lies. They reflect the commendable change in the attitude of the railways generally toward motor transport that has occurred only recently. These conclusions are published in full in the abstract of the committee's reports in this issue, and only three will be repeated here. One conclusion is as follows:

"These inroads on both passenger and freight revenues of many railways warrant those roads in giving serious consideration to the use of motor vehicles to meet this competition, where there is justification for such motor service either from the standpoint of public convenience or from the standpoint of economy."

Another is: "That the railroads have no quarrel with the bus or truck as honest competitors, subject to the same laws, economic or otherwise, as themselves. They welcome legitimate competition as an assurance of even better than the 'good service' now rendered."

The other, which is the last, is: "The railroads prefer to consider such operations (bus and truck operations) as auxiliary to their own and to make use themselves of the motor vehicles as adjuncts to their own operations."

The change in the attitude of the railways toward bus and truck transportation as reflected in this committee report is an encouraging sign to those whose sole desire is better transportation service. Once generally considered competitors and competitors only, buses and trucks are now viewed by the members of the superintendents' association and by other railway officers as auxiliaries. Competitors cannot do much to improve the equality of transportation service since they cannot work together. Auxiliaries, however, by their very nature, do work together, and as auxiliaries, the railways and motor buses and trucks can bring about great improvements in transportation service.

# Superintendents Favor Motor Vehicle as Railroad Auxiliary

*Approve committee report findng buses and truciks advantageous when co-ordinated with rail lines*

AT the meeting of the American Association of Railroad Superintendents in San Francisco on June 21-24 the Committee on the Motor Bus and Motor Truck as Auxiliary Agencies in Railway Transportation, of which M. F. Steinberger, special engineer of the Baltimore & Ohio, was chairman, presented a voluminous report, quoting, in part, from its report of last year and also quoting from the report of the Committee on Economics of Railway Operation of the American Railway Engineering Association, a resume of which appeared in the Daily Edition of the *Railway Age* for March 10. The report also includes a number of tables showing the extent and character of the use of motor trucks and motor buses by the railways, based on data secured from the *Railway Age,* and which have appeared at various times during the past year in the *Motor Transport Section.*

One of these tables discloses the fact that there are now in service on the Class I railroads a total of 1,637 trucks, 49 tractors and 215 trailers. The New York Central is the largest truck operator, with 1,000, the Erie operates the greatest number of tractors, 15, while the Southern Pacific leads in the number of trailers in operation, with 60. Another table gives in detail the number of buses operated by each railroad, and shows a total of 698 buses in operation. The New York, New Haven & Hartford leads with 190 buses, the Great Northern is second with 157 and the New York Central is third with 81.

The committee summarizes the situation as follows:

### End Uneconomic Competition, Adopt Motor Vehicle Where Advisable

The past year has brought an increasing use of motor buses and motor trucks by the railroads and has also given evidence that a stabilization of this use of such equipment generally is coming about. The smaller and less responsible operators are gradually being eliminated through stress of uneconomic operation, or being absorbed by the larger companies. This affects the railroads in two ways, one: where the bus operation is discontinued the competitive feature is removed, and two; where consolidation ocurs, the competition is intensified. The problem in its essentials is, therefore, the same, less in certain phases and, intensified in others, and as a result the activities of the carriers should be directed to the achievement of the following ends:

1. The taking of any legitimate steps to eliminate the operation of the uneconomic competitive operation.
2. The effort to make an auxiliary of those operations which are justified by economic considerations.

### Ten Situations Where Railroads Use Trucks to Advantage

The committee presented a general summary of the various applications of the motor truck to railway operation, as follows:

1. For the transfer of less-than-carload freight between main and substations in the same terminal.
2. For the transfer of less-than-carload freight between the stations of various roads in the same terminal.
3. For the transfer of freight from inland (or off-line) stations in a terminal to the rail stations.
4. In effecting store-door delivery.
5. In effecting store-door deliveries through constructive stations.
6. In the replacement of package locals, for handling l. c. l. freight between stations on a railroad division.
7. In lieu of lighterage at New York and other ports.
8. In the transfer of freight from shipper's doors to railroad cars where the use of containers is involved.
9. For the transfer of freight between divisions (across country) to eliminate movement through congested terminals.
10. For the handling of company material between shops and other company buildings and departments.

The prevailing reasons which can be assigned for the adoption of the motor truck in the above operations are: (a) Economy in operation; (b) Expedited movement.

These tabulations were not presented for the purpose of showing that the motor truck can be generally adopted and result in expedited movements or lowered costs, but to indicate that there is a field for its use by the railroads, and that special investigations do develop places where the motor truck can be successfully used by the railroads as an auxiliary to their rail service. There is no general rule for their application; each situation must be analyzed carefully and decided on its own merits. In general, various applications have indicated that the justifiable use of motor trucks by the railroads is in terminal operations and on hauls up

to about 50 miles where train operation economies can be secured by the substitution of trucks.

## Contract, Subsidiary or Direct Operation

It may not be amiss to say a word as to the manner in which the railroads are operating their motor trucks. These methods are:

1. By the railroads themselves through motor divisions.
2. Through subsidiary companies.
3. Through the medium of contracts with independent companies. The latter scheme seems to be the one most generally used.

It was not possible to secure any figures as to the costs of such operations, which could be used as a basis or representative of average conditions. So many variables enter into these plans as to make a comparison of costs useless. What a railroad can afford to pay for such service depends entirely upon the present cost of rendering the same service by other means or the value from a traffic standpoint of securing expedited movements.

It is not the opinion of the committee that the railroads should instal motor truck lines as competitors of truck lines operated by independents unless their studies develop that a real public need will be met by such installation, or that there is definite economic justification for them.

## Seven Railroad Uses for the Bus

The uses generally to which motor buses have been put by the railroads are:

1. In replacement of local train service.
2. As additional service auxiliary to local train service.
3. As additional service to make the local stops feeding faster trains at zone points.
4. As feeder lines.
5. In handling of employees to and from shops, etc.
6. Train connection service in terminals as at New York.
7. In tour service to summer resorts, National Parks, etc.

The last two furnish the greatest advances during the past year.

## Subsidiary Favored as Bus Operator

Generally speaking the same methods of operation are used by railroads for handling motor bus operations as for motor trucks, i. e.:

1. By railroad company.
2. Through contract with existing operator.
3. Through subsidiary companies.

It is the last scheme which has secured the greatest favor, and is most generally used.

With respect to costs of operation it is felt that that phase should also be dealt with only generally. Statistics obtainable show expenses of bus line operation to range somewhere between 25 and 40 cents per mile.

Their adoption depends upon other factors in addition to costs (a) traffic expediency; (b) ability of bus to perform same service as train; (c) road conditions; (d) cost of operation.

Having adopted the opinion that there are places where the railroads can and should avail themselves of the use of motor trucks and motor buses where the justification for such use exists it would appear that the task of the railroads is twofold.

First: To determine at what places such operations are justified; second, to develop definite plans for combating those truck or bus lines which are inaugurated or proposed and which are not justified by public convenience or necessity or from other economic considerations.

## What of the Highway Competitor

With respect to the first it is comparatively easy task for representatives of the traffic and operating departments to arrive at decisions as to the propriety of installing certain operations of this nature. With respect to the second it is felt that the following considerations have a bearing on the situation:

1. Taxes paid by these operators as compared with railroads.
2. Rates of fare charged.
3. Schedules.
4. Liability for damages, loss, injury, etc.; i. e., financial responsibility.
5. Rules as to personnel—proper training—physical requirements, etc.
6. Regulations as to weights, sizes and other characteristics of their equipment.

## Conclusions

Your committee wishes to sum up the result of its investigation in the following paragraphs:

1. There is a real place for the motor truck and motor bus in the transportation field.
2. That field has been generally in the comparatively short haul of passengers, and less-than-carload freight, where expedited and frequent service, frequently from points more accessible than railroad stations is desired.
3. The growth of the long distance lines across country and along the Western Coast indicate, that under special conditions, there is some demand for service of that nature.
4. Motor competition is here and must be recognized.
5. This competition has seriously affected the revenues of the rail carriers.
6. These inroads on both passenger and freight revenues of many railroads warrant those roads in giving serious consideration to the use of motor vehicles to meet this competition where there is justification for such motor service, either from the standpoint of public convenience and necessity, or from the standpoint of economy.
7. A sufficient number of instances have been cited to demonstrate the fact that it is possible and practicable to co-ordinate rail and motor transportation.
8. There are inequalities in the method of assessing taxes against motor vehicles as compared with the railroads.
9. That there is a lack of uniform regulations as to rates, schedules, etc., of motor vehicles as compared with railroads.
10. That justice and fairness demand that motor transportation be regulated on the same basis as the railroads, both as to regulation and taxation.
11. That railroads have no quarrel with the bus or truck as honest competitors, subject to the same laws, economic and otherwise, as themselves. They welcome legitimate competition as an assurance of even better than the "Good Service" now rendered.
12. The railroads prefer to consider such operations as auxiliary to their own and make use themselves of the motor vehicle as adjuncts to their own operations.

## Discussion

George Brophy, special representative, Union Pacific, described the loss of traffic to motor vehicles, stating that one million head of stock were brought into the Omaha market last year by trucks and 750,000 head into the Denver market. He urged the members to agitate for the uniform regulation of buses to place them on an equal basis with the railroads. A. E. O'Dea, supervisor of transportation, Lehigh Valley, deprecated the slowness of the railways in entering the motor transport field, believing that they should give more consideration to the operation of motor buses and trucks to meet highway competition.

T. B. Wilson, vice-president, Southern Pacific Motor Transport Company, maintained that there is an economical field for buses and trucks as auxiliary facilities of a railroad. He described the truck operation of the Southern Pacific in Oakland, Calif., where freight is handled between the central station and 18 subsidiary stations by the use of trucks with Lapeer trailers and box car bodies. By means of this equipment it has been possible to release 70 box cars while the movement of freight is expedited, and it is possible to offer later closing hours at the outlying stations and still get the freight into cars moving out that night. The equipment consists of five tractors with approximately 60 ten and twelve ton vans.

M. F. Steinberger, assistant to vice-president, Baltimore & Ohio, described the zone system of handling freight on that road between Baltimore and Washington, by means of which the service has been improved and one way freight eliminated with a saving of $1,400 per month. Mr. Steinberger took issue with the statement frequently expressed that the motor industry is not paying its way in taxation, presenting statistics showing that this industry contributes more than $600,000,000 annually in various forms of taxes, half of which comes from buses and trucks. He also referred to the growing appreciation among railway men of their duty to give the public the service it desires rather than confining their activities to the railway right-of-way.

F. W. Kelsey, division superintendent, Nashville, Chattanooga & St. Louis, described an installation of motor buses on his road, whereby the replacement of

steam passenger train service by motor buses reduced the deficit from $17,000 per year to $6,000. E. R. Anthony, division superintendent, Southern Pacific, related the disastrous experiences of independent truck operators in California in long haul operation and stated that one such company operating between San Francisco and Los Angeles has resorted to the use of portable vans, which are loaded at either terminal and then transferred to freight cars for transportation from one city to the other, the vans being of such size that four or five can be mounted on one car.

R. Campos, assistant to freight traffic manager, National Railways of Mexico, reported that the railways of that country are meeting little motor competition for other than short distances and that motor rail cars are being used to handle this traffic.

The report of this committee was accepted and the subject continued for further investigation.

# Five Railrads Report on Motor Transport

SEVERAL of the many roads which employ motor vehicles in either passenger or freight service or both make brief mention of their activities in their annual reports for 1926. Extracts of such material from the annual reports of the New York, New Haven & Hartford and the Boston & Maine, appeared in the *Motor Transport Section* of April 23, page 1299.

Comments of five other roads, to wit, the Denver & Rio Grande Western, the Lehigh Valley, the Norfolk Southern, the Pennsylvania and the Rutland, as they appear in their annual reports for 1926, follow:

## D. & R. G. W. Operations Prosper

The Denver-Colorado Springs-Pueblo Motor Way, Inc., was organized to take over the equipment and assets of the Greeley Transportation Company, which had been operating passenger buses between Denver and Colorado Springs, Colo., 75 miles. Your company purchased 50 per cent of the authorized stock, the Colorado & Southern Railway Company 25 per cent, and the Greeley Transportation Company interests 25 per cent. Operation by the new company between Denver, Colorado Springs and Pueblo, 120 miles, commenced April 25, 1926. Earnings for the period April 25 to December 31, 1926, after caring for operation, depreciation and taxes, amounted to $8,082.07, or 13.47 per cent on $60,000 stock outstanding.

The Western Slope Motor Way, Inc., was organized to take over the equipment and assets of the Motor Transportation Company, which operated both passenger and freight service between Grand Junction, Delta, Paonia and Montrose, Colorado—103 miles. Your company purchased two-thirds of the stock issued, the remaining third being retained by the Motor Transportation Company interests. Operation commenced June 1, 1926, under the supervision of the new company. Earnings for the period June 1, 1926, to December 31, 1926, after caring for operation, depreciation, replacements and taxes, were $1,675.41, or 3.2 per cent on $52,500.00 outstanding stock.

Through railroad control of these bus lines, and with certificates of public convenience and necessity granted by the Public Utilities Commission of Colorado, it is possible to retain for the railroads interested, passenger and freight business which would otherwise go to various small independent operators, and which has steadily increased in the past few years with resultant loss in traffic to the railroads.

## Lehigh Valley Expands Freight Service

Other important additions to the freight facilities of the Lehigh Valley include the opening of two new inland stations [i.e., served by motor vehicles] in New York, bringing the total of these stations to four, which are in addition to the freight terminals of the Lehigh Valley located on the Hudson, East and Harlem Rivers.

## Norfolk Southern Uses Bus to Hold Traffic

Passenger revenue continued its downward course and was $152,024.81, or 15.06 per cent less than for the year previous. A subsidiary company was created during the year for the operation of motor bus service between Norfolk and Virginia Beach, via Cape Henry, where there has been an especially heavy decrease in passenger travel.

## Pennsylvania Keenly Interested

Your company is continuing to study the development of motor transportation. Wherever the public demonstrates its preference for the use of private and commercial motor vehicles in the territory served by your lines, efforts are being made to adjust the rail service accordingly, but in some cases short stretches of railroad mileage have had to be abandoned where the revenues were not sufficient to pay the costs of operation and taxes. The management recognizes that the private motor car, the motor bus and truck furnish very flexible instruments of transportation. They are especially adapted to light loads and short distances, and to service demanding prompt changes to meet varying conditions and character of traffic. For that reason it has co-operated with various companies specializing in this form of transportation, and, in addition, applied for a charter for the operation of its own motor service in the various counties in Pennsylvania now served by your rail lines. The application was denied, but the subject is receiving careful consideration and proper steps will be taken from time to time to protect the interests of your company.

## Rutland Saves $4,500 in Three Months

The Rutland Transportation Corporation, which this company caused to be organized with a view to substituting motor bus service to such extent as the public authorities might approve in place of unprofitable rail passenger service on the Chatham division, issued during the year $30,000 of its capital stock, all of which was acquired by this company. It commenced the operation of buses between Bennington and Chatham on September 20, 1926. The inauguration of the bus service enabled this company to discontinue the mixed trains which it had previously run daily in each direction between those points and to put the local freight service on an alternate day basis. From September 20 to the end of the year the buses carried 2,189 passengers from whom it received a gross revenue of $940.25. In the corresponding period of 1925 the mixed trains, now replaced by the buses, carried 1,332 passengers yielding a gross revenue of $535.76. For the last quarter of 1926 the net loss from the operation of the buses was $1,110.44, while the net saving to this company from the discontinuance of the train service replaced by bus operation was $4,493.97.

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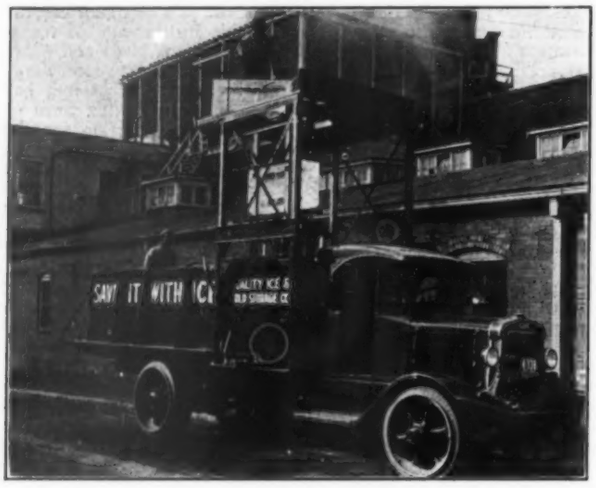
A GASOLINE TAX of 2 cents a gallon was placed in effect in New Jersey on July 1. At the same time a levy of 1½ cents per mile was placed on buses and trucks engaged in interstate commerce. One interstate bus line has secured a restraining order against the application of this latter tax from the Federal Court, and the tax will not be levied against that company pending a court decision. However this will not prevent a collection of the tax from other interstate operators.

**Automobile and Motor Bus Exhibit at the Leipzig, Germany, Trade Fair—This Fair is Held Annually and is International in Scope—It Will be Held this Year August 28 to September 3, Inclusive**

# Truck with Elevating Equipment Reduces Car Icing Cost

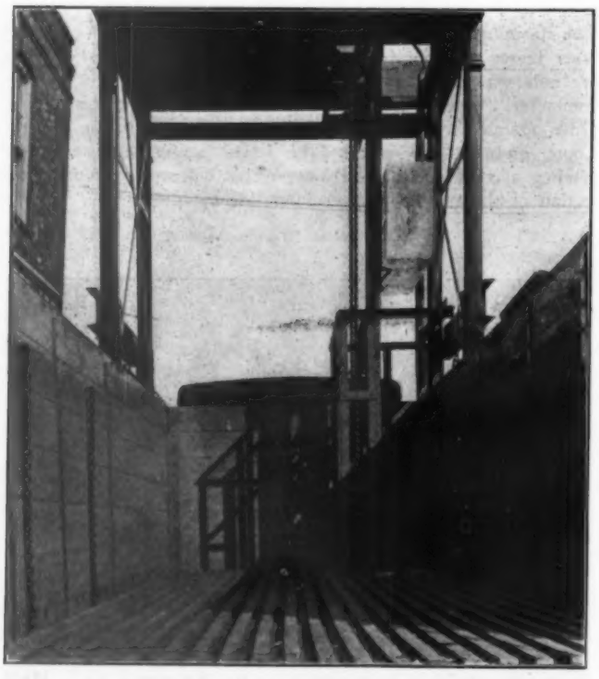
THROUGH the use of a five-ton G. M. C. truck equipped with a telescoping-tower elevator, the Quality Ice & Storage Company of Kansas City, Mo., has reduced the cost of providing icing service which it contracts to furnish the Chicago, Burlington &




**G.M.C. Truck Fitted with Icing Elevator**

Quincy in Kansas City, and the problem of icing cars has been simplified for the railway.

The truck used is fitted with an ice body built on the



**Interior View of Elevator-Equipped Truck**

conventional lines with the exception that at the front end there is a telescoping elevator tower which is raised into position and lowered by a small hand winch at the side of the truck. This elevator tower is lowered while in transit with a load of ice and is raised when it is moved into position alongside a refrigerator car. A power take-off drive is engaged to operate an endless chain traveling at a comparatively low speed. With the power take-off engaged and the engine turning at slow speed, the driver is free to assist in the handling of the ice. As a result, the operation requires only two men.

The height at which the ice is unloaded may be varied according to the height of the refrigerator car. One man works in the body of the truck, moving the 300-lb. cakes of ice onto the elevator, and the other working on the refrigerator car transfers the ice from the elevator to the ice compartments in the car. The simplicity of the operation results in the saving of the time required to ice the car and also reduces the melting of the ice.

From the standpoint of the railway this plan of operation has its advantages in that it is not necessary to set apart space and to construct elevated platforms of railroad car height for use in icing cars. Neither is it necessary to switch refrigerator cars to an icing platform. The only requirement of the elevator-equipped ice truck is a roadway on which it can pull up alongside the cars to be iced.

# O.-W. Begins Operation of Portland-Pendleton Bus Line

THE inauguration of motor bus service between Portland, Ore., and Pendleton, a distance of approximately 215 miles, was effected by the Oregon-Washington Railroad & Navigation Company on July 1. The bus line is being operated by the Union Pacific Stages, Inc., a Union Pacific subsidiary, of which Carl Beach is superintendent, with headquarters at Pendleton, Ore.

The equipment used on the line comprises five parlor type buses, two of these being Mack buses, of 28-passenger capacity, and three A.C.F. buses of 26-passenger capacity. Two round trips daily are being made between Portland and Pendleton. Eastbound buses leave Portland at 6:50 a. m. and 1 p. m., arriving at Pendleton at 1.30 p. m., and 10.40 p. m., respectively. Westbound buses leave Pendleton at 7.05 a. m., and 12.30 p.m., and arrive at Portland at 5.45 p. m. and 10 p. m., respectively. The Sixth street terminal at Sixth and Salmon streets is being utilized t Portland. The one-way fare between Portland and Pendleton is $7.50, and the round trip fare, $11.25, these being the same as those of a competitive bus line between Portland and Pendleton. This fare is slightly less than the one-way railway fare, which is $7.70. One of the buses in this service is illustrated on the front cover of this issue.

The Portland-Pendleton buses will connect at Pendleton with Oregon-Washington buses operating on the line between Pendleton and Walla Walla, Wash. This line has been in operation nearly two years.

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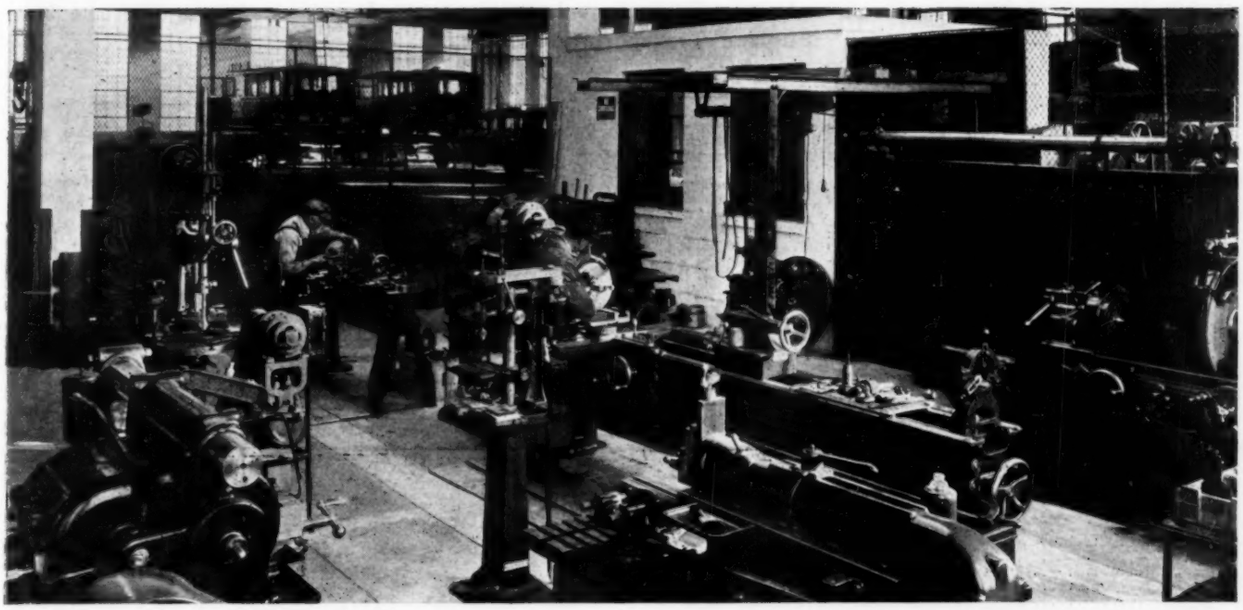
IN THE FISCAL YEAR ended June, 1925, a billion and a half dollars were spent in the United States for road building and maintenance according to a detailed study just completed by the National Industrial Conference Board. The annual road bill now amounts to more than one-sixth of the entire public budget and is exceeded among governmental expenditures only by those for education and protection. About a million miles of highways have been built since 1904, at which time the total was about two million, only a small proportion of which was surfaced. In 1925 more than 17 per cent were graded and surfaced.



*The Machine Shop.*

# N. E. T. Maintenance Activities Center at New Providence Garage

*Well-equipped with modern machinery and tools—*
*High standards for painting make buses*
*always attractive in appearance*

PART II*

IN view of the fact that the Providence garage was built to handle heavy repairs, it was imperative that the machine shop be equipped with machine tools on which any work could be handled. The list of machines in this shop are shown in Table II. The grinding of crank shafts and cylinder blocks, the turning to size and chamfering of pistons, are only a few of the many jobs handled in this shop. In addition, a large number of special sizes of reamers, taps and dies are made. This work is made necessary owing to the lack of standardization of threads and sizes of nuts and studs found on the six different makes of buses serviced at this garage.

The machine shop force consists of two machinists and two machinist helpers who are capable of operating all of the machines in the shop. The machine shop is in operation only during the daylight trick.

Every effort has been made to equip the machines and furnish the operators with adequate auxiliary equipment by which work may be economically and quickly machined. The Norton universal grinder is equipped with an O.S. Walker No. 610 magnetic chuck; the Hoefer 24-in. drilling machine is equipped with a Westcott chuck and a Brown utility vise. The shop is equipped with nine drop forged, bent tail, lathe dogs, six Armstrong tool holders and two Armstrong boring tool holders.

*Part I of this article appeared in the Motor Transport Section of June 25.

The circulating tool room is in the machine shop. Here again, no expense has been spared to equip it with adequate tools. Among many other tools found in this room are a set of Brown & Sharpe bushing mandrels ranging from ¼ in. to 2 in. in steps of 1/16 in.; Morse twist drills from ¼ in. to 2½ in., inclusive; expanding

**The Motor Shop Has Facilities for Repairing Five Motors at One Time**

## Table II—List of Machine Tools and Shop Equipment Located at the Providence Garage of the New England Transportation Company

*Machine Shop*

| No. | Size and Capacity | Type of machine and builder |
|---|---|---|
| 1 | 18-in. to 36-in. | Extension gap lathe, Rahn Larman Co. |
| 1 | 14-in. by 6-ft. | Tool room lathe, Rockford Lathe & Drill Co. |
| 1 | 24-in. | Sliding head vertical drill press, Hoefer Manufacturing Co. |
| 1 | 11/32-in. | Sensitive drill press, Longelier Manufac. Co. |
| 1 | 12-in. | Double end floor grinder, Hisey-Wolfe Machine Co. |
| 1 | 2½-in. | Double end drill grinder, Grand Rapid Grinding Machine Co. |
| 1 | No. 1 | Universal cutter and tool grinder, Norton Co. |
| 1 | 18-in. by 22-in. | Auto-part grinder, Norton Co. |
| 1 | No. 50 | Cylinder grinder, Heald Machine Co. |
| 1 | 6-in. by 6-in. | Power hack saw, Peerless Machine Co. |
| 1 | No. 2 | Universal milling mach., Kempsmith Mfg. Co. |
| 1 | 16-in. | Crank shaper, Ohio Machine Tool Co. |
| 1 | | Valve refacer, Black & Decker Mfg. Co. |

*Electric Repair Shop*

| | | |
|---|---|---|
| 1 | 24 position | Battery charger, Electric Machine Corp. |
| 1 | | Universal test stand, Electric Machine Corp. |
| 1 | | Battery tester, Electric Machine Corp. |
| 1 | | Bearing press, Electric Machine Corp. |
| 1 | | Milli-volt tester with armature stand, Electric Machine Corp. |
| 1 | | Magneto vise, Electric Machine Corp. |
| 1 | 110-volt | Magneto, Electric Machine Corp. |
| 1 | | Magneto driver, Electric Machine Corp. |
| 1 | 110-volt | Utility growler, Electric Machine Corp. |
| 1 | | Utility growl-o-meter, Electric Machine Corp. |
| 1 | | Growl-o-meter, Electric Machine Corp. |
| 1 | | Armature tester, Electric Machine Corp. |
| 1 | | Muca undercutter, Electric Machine Corp. |

*Blacksmith Shop*

| No. | Size and Capacity | Type of machine and builder |
|---|---|---|
| 1 | | Motor driven forge, Buffalo Forge Co. |
| 1 | No. 1-E | Motor driven hammer, Champion Blower & Forge Co. |
| 1 | No. 2, 12-in. knives | Shear, Champion Blower & Forge Co. |
| 1 | 12-in. | Double end floor grinder, Hisey-Wolfe Machine Co. |
| 1 | 60-ton | Hydraulic press, Manley Manufacturing Co. |
| 1 | 30-ton | Hand press, Manley Mfg. Co. |
| 1 | | Lewis brake lining machine, Provident Machine Co., Inc. |

*Body Shop*

| | | |
|---|---|---|
| 1 | 52-in. | Metal shear, Peck, Stow & Wilcox Co. |
| 1 | | Chicago steel bending brake, Dries & Krump Manufacturing Co. |
| 1 | No. 55 | Universal woodworker, Crescent Machine Co. |
| 1 | | Motor-driven sewing machine, Singer Sewing Machine Co. |

*Miscellaneous Equipment*

| | | |
|---|---|---|
| 2 | | Venturi suction torches, Hauck Manufacturing Co. |
| 1 | | Riveting hammer, Cleveland Pneumatic Tool Co. |
| 1 | | Chipping hammer, Cleveland Pneumatic Tool Co. |
| 4 | | Electric bus hoists, Columbia Machine Wks. |
| 2 | 4-ton | Chain hoists, Yale & Towne Mfg. Co. |
| 1 | 2-ton | Portable ratchet crane, Manley Mfg. Co. |
| 1 | 3½-ton | Wrecker, Mack Trucks, Inc. |
| 1 | | Gas welding outfit, Linde Air Products Co. |
| 3 | ½-in. | Electric drill motors, Black & Decker Mfg. Co. |
| 2 | 1-in. | Electric drill motors, Black & Decker Mfg. Co. |
| 3 | ¾-in. | Electric drill motors, Black & Decker Mfg. Co. |
| 12 | 20-in. | Stationary Hi-Lo jacks, Garage Utilities Co., Inc. |
| 12 | 36-in. | Stationary Hi-Lo jacks, Garage Utilities Co., Inc. |

and straight reamers from ¼ in. to 2¼ in., inclusive, valve spring compressors, etc.

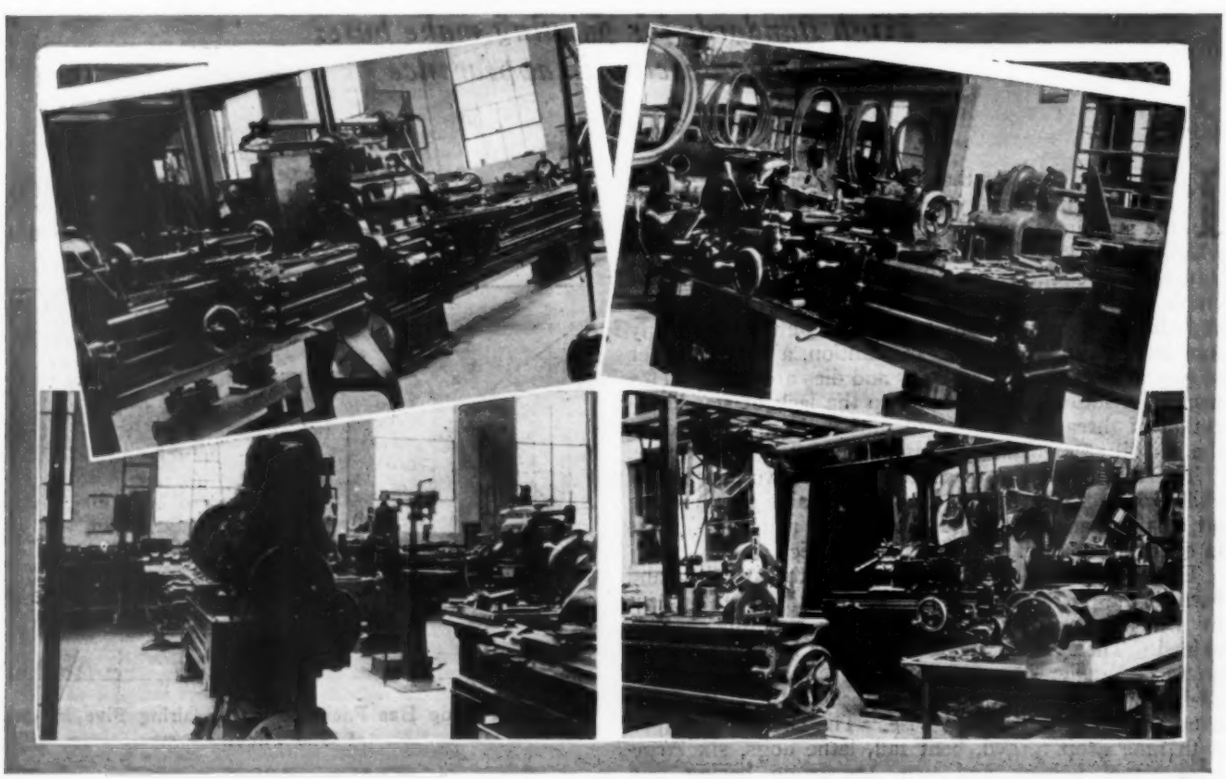
### Motor Shop

The motor shop is equipped to dismantle, repair and assemble any type of gasoline motor. At the present time, five adjustable motor stands are in use, each accompanied by a portable work bench on which the mechanic can put his tools and small parts of the motor.

Only recently it has been decided to repair all of the motors of the New Haven rail-motor cars at the Providence garage.

### Electrical Department

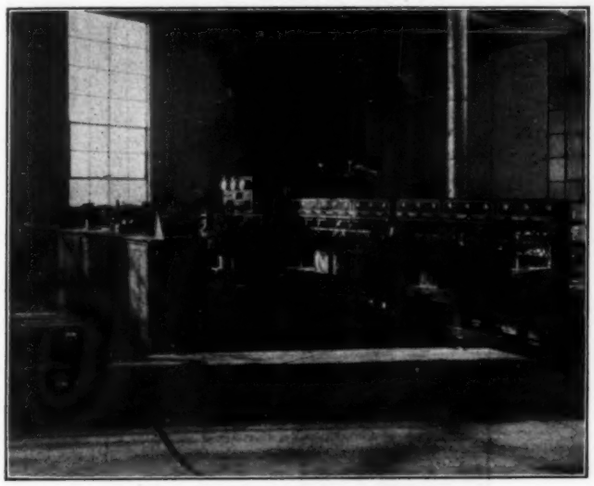
The electrical department is exceptionally well equipped to make repairs to the varied assortment of electrical equipment found on the buses serviced at this garage. As Table II shows, there are 13 units of elec-



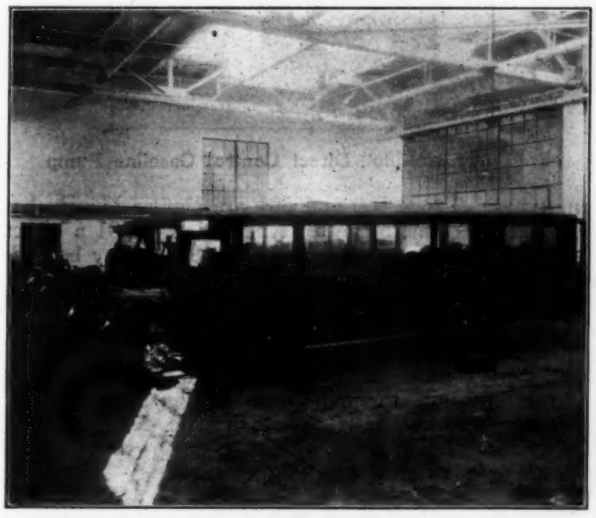
**These Machine Tools Are a Few of the Modern Units in the Machine Shop Located at the Providence Garage of the New England Transporation Company**

trical equipment, all of which are properly located, as shown in the illustration, for the convenience of the electricians. The battery charging unit has a maximum capacity for 20 16-volt and 40 six-volt batteries. There are no facilities for repairing batteries. Two electricians and one helper are responsible for the complete overhauling of all electrical equipment.

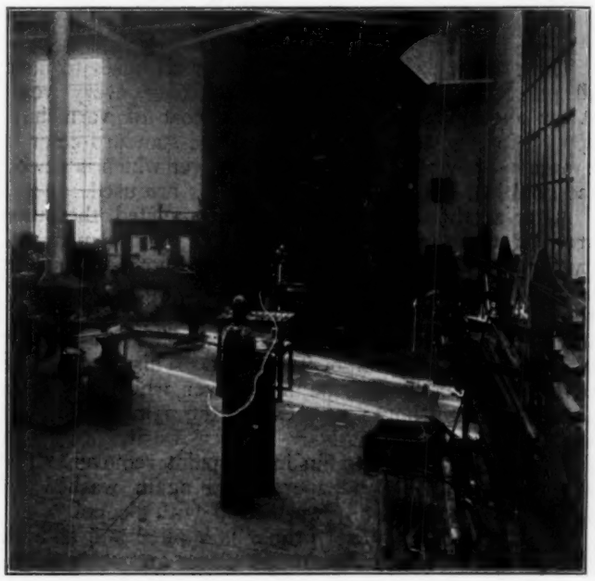
The company has experienced considerable battery trouble owing to an overloaded condition of the single 12-volt, 11-plate batteries used in the buses. To meet this condition, it was necessary to overcharge the batteries. As a result, the plates quickly deteriorated and the life of the batteries was relatively short. Furthermore, 14 different types and sizes of batteries are used in the buses. To remedy this situation it was decided to standardize on one type and size of battery. As each bus comes in for a general overhauling, two six-volt, 21-plate batteries, connected in series, are put in place of the one 12-volt battery. These batteries are designed so that the sediment may be washed out through a hole in one end of the battery without removing the plates. The two batteries are placed in a special box located at the extreme rear end of the bus body. An upholstered seat, which will accommodate five passengers, is placed over the box. Many of these batteries have now been in service for some time and no trouble whatever has been experienced.



**The Electrical Department Is Well Equipped to Repair All Types of Electrical Equipment**



**The Paint Shop Has a Maximum Capacity for Five Buses**



**The Blacksmith and Welding Shop**

### Blacksmith Shop

The blacksmith shop is equipped to handle any forge work incident to giving a bus a general overhauling.

**Any Metal or Wood Repairs Can be Made to a Bus Body in the Body Shop**

When a bus body is removed from the chassis, the latter is inspected and any loose rivets are replaced, or bent members repaired by the blacksmith. This shop is not equipped for spring repairs owing to the very small number of broken springs which have to be replaced. Those springs that need repairs are sent to an outside shop. An adequate number of new springs is kept in stock.

The body shop is fully equipped to make any repairs to the wood structure of the bus and to put on a new

metal body, if necessary. The tools used in this shop are listed in Table II. All upholstery work, including new roof covers, is done by specially trained workmen. The metal body worker also does all welding about the shop, using Linde gas-welding equipment.

### Paint Shop

The present paint schedule calls for all buses to have all paint removed and new applied once every year. After about six months' service a coat of varnish is applied to brighten up the finish. The standard color is a maroon body with a black belt line over which is placed the gold leaf lettering. Enamel paints are used.

After all the mechanical work is completed, the buses are sent to the paint shop, which has a maximum capacity for five coaches. If a new top has not been put on the bus, the top receives a coat of black top paint. Then the wheels are removed for painting. The car is painted underneath and cleaned out inside. The car is now ready for the removal of the paint. This is done by covering the body with paint remover which is left to soak for several hours, after which the paint is removed with steel wool. The body is then washed off with gasoline to kill the paraffin in the paint remover. The surfaces are then sandpapered and again washed off with gasoline, and finally washed off with alcohol.

The first coat of metal primer is applied and allowed to dry for 24 hours. Any rough places are sandpapered and filled with putty. Two coats of enamel undercoating are applied, 30 hours being allowed between coats for drying. The surface is then thoroughly gone over with sandpaper and water. Any spots that may be rubbed through are touched up. One coat of maroon finishing enamel is applied and allowed to dry for 24 hours. The belt line then receives one coat of flat black and one coat of black enamel. The body is then rubbed down with pumice stone and the letters put on with gold leaf. One coat of clear enamel finishing varnish is then applied and the car is then left to dry over night. The wheels and the nickel trimming are then replaced.

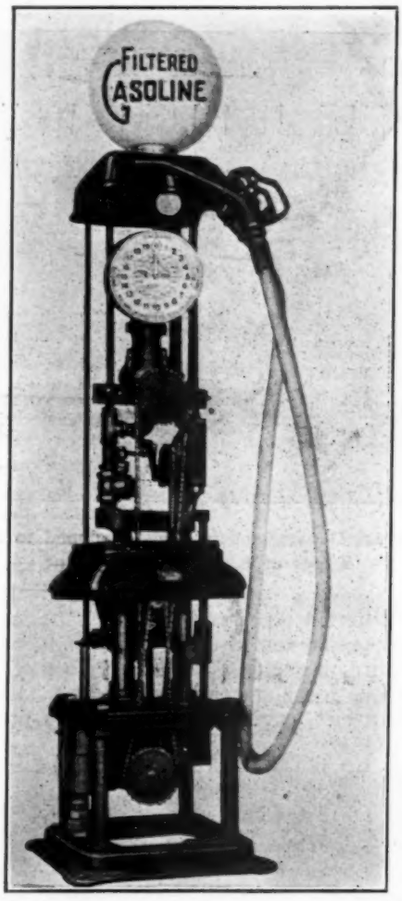
The inside of the bus does not require much painting. The floor and the base of the seats receive one coat of brown lead oil paint. The driving wheel receives two coats of shellac and one coat of clear varnish. The dash board receives one coat of black enamel. The garnish rail is scraped after which it receives one coat of clear varnish.

# Four Types of "St. Louis Multiflo" Gasoline Pumps Offered

THE St. Louis Pump & Equipment Company, St. Louis, Mo., has developed four models of gasoline pumps, all based on its "Multiflo" system which provide continuous flow nozzle control, electric operation and simple design. In operating these pumps the hose is removed from the hose hook and the entire control of the flow is then at the end of the hose, which is equipped with a special "St. Louis" shut-off nozzle. The indicating hands of the measuring device register the quantity of gasoline delivered, these hands being arranged on a large clock dial, one hand making the entire circumference of the dial for each gallon and the other hand registering the entire number of gallons dispensed. The hands are returned to zero by the turning of a thumbscrew setback. The total number of gallons of gasoline, removed from the storage tank is indicated by a totalizer set near the middle of the dial and furnished with a cover to prevent unauthorized reading. The gasoline is pumped from the storage tank at any speed up to 20 gal. per minute.

The gasoline is pumped by means of a "St. Louis" rotary piston pump and all gasoline passes through a monel metal filter which may be easily removed for cleaning by taking the cap from the top of the filter. The electric motor used is a specially developed type and, in conjunction with the mercury switch and electric wiring, constitutes a fully enclosed vapor-proof assembly which meets all requirements of the Underwriters' Laboratories.

The "St. Louis Multiflo" systems are furnished in four types. Types 500 and 501 are similar except that type 500 is a remote control type and type 501 a direct control unit. The remote control type 500 may be converted into a direct control type by the installation of the motor and pumping unit. The direct control type 501 is a complete system within itself but it can be used as the central unit for as many as three of the type 500 units at the same station. The third type, No. 505, is a remote control unit only to be used in conjunction with the pumping assembly, and the fourth type, No. 510, is a remote control unit only, without housing, to be placed in brick or other specially designed cases.




**"St. Louis Multiflo" Direct Control Gasoline Pump**

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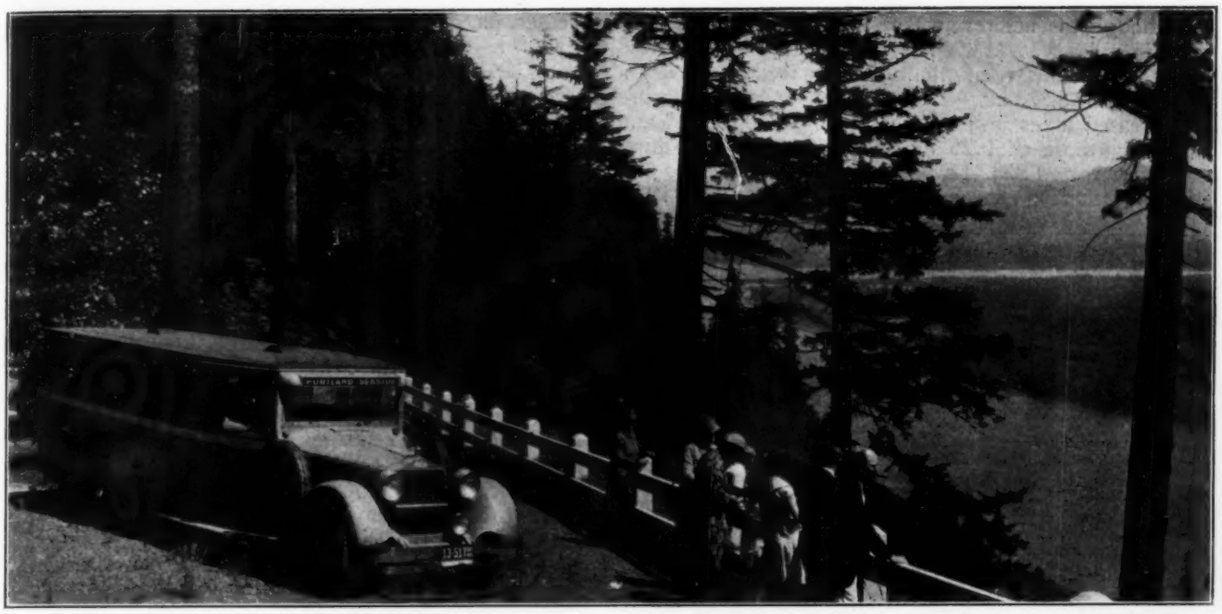
MOTOR BUS service between Batavia, Java, and the outer and inner harbor piers was established on May 1 by the State Railway of the Netherlands East Indies. Four buses have been put in operation, each designed to carry 6 first class and 20 second class passengers. The length of the bus service line is approximately 0.6 mile.



*Panoramic View of Columbia River from Clatsop Crest*

# S. P. & S. Shows Large Increase in Bus Traffic

## *Operating revenues up more than one-third in 1926— Operating cost 22 cents per mile*

THE Spokane, Portland & Seattle Transportation Company, bus-operating subsidiary of the Spokane, Portland & Seattle, carried 299,863 revenue passengers in 1926, receiving from them $239,-030.56. Its total operating expenses were $229,005.96, or 22.45 cents per bus mile. These figures are contained in the comparative income statement and miscellaneous operating statistics of the transportation company for last year.

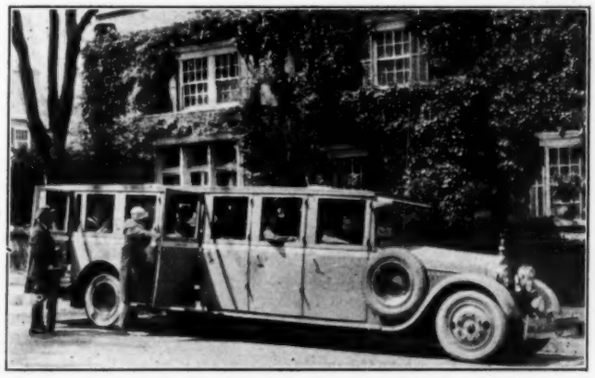
The S. P. & S. Transportation Company operates a frequent motor bus service supplementary to its rail service between Portland, Ore., and the seaside resorts along the Pacific coast, 134 miles west of Portland. Its operations and territory were described fully in the *Railway Age* of February 27, 1926, starting on page 548.

**Comparative Income Statement**

| | 1926 | 1925 | Increase or decrease |
|---|---|---|---|
| Total operating revenues | $252,970.08 | $187,958.55 | $65,011.53 |
| Total operating expenses | 229,005.96 | 165,096.01 | 63,909.95 |
| Net revenue | $23,964.12 | $22,862.54 | $1,101.58 |
| Taxes | 10,769.82 | 6,095.02 | 4,674.80 |
| Operating income | $13,194.30 | $16,767.52 | *$3,573.22 |
| Non-operating income | | | |
| Miscellaneous non-operating income | $36.95 | $19.42 | $17.53 |
| Income from unfunded securities and accounts | 1,146.48 | 431.88 | 714.60 |
| Total non-operating income | $1,183.43 | $451.30 | $732.13 |
| Gross income | 14,377.73 | 17,218.82 | *2,841.09 |
| Deductions from gross income | | | |
| Interest, etc. | 10,816.13 | 6,325.62 | 4,490.51 |
| Net income | 3,561.60 | 10,893.20 | *7,331.60 |

*Decrease.

The total operating revenues of the transportation company in 1926 were $252,970.08, an increase of $65,-100.53 over the preceding year. This increase was largely due to a considerable expansion of the operations of the transportation company, including a small increase in the miles of route operated and a 75 per cent increase in the number of schedules. The expanding operations naturally resulted in a considerable increase in operating expenses. In 1926, these were $229,005.96, an increase of $63,909.95 over the preceding year.



**S. P. & S. Buses Serve an Exclusive Residential District in Portland**

Although the net revenue of the transportation company in 1926 was $23,964.12, an increase of $1,101.58 over the preceding year, the operating income showed a decrease of $3,573.22. This was due in large measure to increased taxes in 1926, these being $10,769.82, and exceeding those of 1925 by $4,674.80. Non-operating income increased $732.13, but gross income declined $2,841.09. Interest charges increased $4,490.51 in 1926, contributing to the decrease in the net income of $7,331.60.

**S. P. & S. Bus on Columbia River Highway Between Portland and Seaside**

### Operations Analyzed

The statistics of the transportation company's operations show in detail the growth, both in operation of buses and in the amount of traffic handled, and also the cost at which these operations have been carried on.

**Miscellaneous Statistics**

| | 1926 | 1925 | Increase or decrease |
|---|---|---|---|
| Miles of route operated | 134.3 | 125.0 | 9.3 |
| Number of one-way trips | 28,947 | 16,901 | 12,046 |
| Average number of cars operated | 19 | 15 | 4 |
| Number of car miles | 1,020,264 | 904,073 | 116,191 |
| Number of revenue passengers carried | 299,863 | 234,036 | 65,827 |
| Number of revenue passengers carried one mile | 8,807,928 | 7,017,609 | 1,790,319 |
| Number of revenue passengers carried one mile per mile of route | 65,584 | 56,140.87 | 9,443.13 |
| Average revenue passengers per car | 8.63 | 7.76 | .87 |
| Average miles per passenger carried | 29.37 | 29.99 | *.62 |
| Total passenger revenue | $239,030.56 | $180,902.98 | $58,127.58 |
| Total other operating revenue | $13,939.52 | $7,055.57 | $6,883.95 |
| Total operating revenue | $252,970.08 | $187,958.55 | $65,011.53 |
| Average revenue per passenger (cents) | 79.71 | 77.30 | 2.41 |
| Average revenue per passenger miles (cents) | 2.71 | 2.58 | .13 |
| Average revenue per mile of route | $1,883.62 | $1,477.22 | $406.40 |
| Average revenue per car mile (cents) | 24.79 | 20.01 | 4.78 |
| Total operating expenses | $229,005.96 | $165,096.01 | $63,909.95 |
| Average cost per car mile (cents) | 22.45 | 18.26 | 4.19 |
| Average cost per passenger mile (cents) | 2.60 | 2.35 | .25 |

*Decrease.

While the number of miles of route operated increased from 125 in 1925, to 134.3 last year, almost 75 per cent more bus schedules were operated. In 1926, 28,947 one-way trips were operated, an increase of 12,046. The S. P. & S. operated an average of 19 buses in 1926, this being an increase of 4 over the preceding year. With the larger number of schedules operated, there was a consequent increase in bus miles of 116,191. The number of bus miles operated in 1926 was 1,020,264.

The number of revenue passengers carried in 1926 increased 65,827, being 299,863 in 1926, while the number of revenue passengers carried one mile increased from 7,017,609 in 1925 to 8,807,928 in 1926. The number of revenue passengers carried one mile per mile of route increased 9,443.13, being 65,584 in 1926.

The S. P. & S. brought about a small increase in the average number of passengers carried in each of its buses. The average number of revenue passengers per bus in 1926 was 8.63, an increase of .87 over 1925. This was partially offset by a small decrease in the average number of miles each passenger travelled, the average length of trip being 29.37 miles in 1926, and 29.99 miles in 1925.

The increase of $65,011.53 in the total operating revenues was brought about by substantial increases in both total passenger revenue and other operating revenues. The total passenger revenue of the S. P. & S. buses in 1926 was $239,030.56, an increase of $58,127.58 over 1925. While the total of other operating revenue in 1926 exceeded that of 1925 by $6,883.95, there having been $13,939.52 from this account in 1926.

In spite of the slight decrease in average miles per passenger carried, the average revenue per passenger in 1926 was 79.71 cents, 2.41 cents greater than in 1925. The average revenue per passenger mile likewise increased, being 2.71 cents in 1926 and 2.58 in 1925. The average revenue per mile of route increased from $1,477.22 in 1925, to $1,883.62 last year, while the average revenue per bus mile was 24.79 cents, an increase of 4.78 cents over 1925.

The average cost of operation per bus mile increased 4.19 cents in 1926, being 22.45 cents in that year as compared with 18.26 cents in 1925. Revenue per bus mile in 1926 thus exceed the cost per bus mile by 2.34 cents as compared with an excess of revenue over operating cost in 1925 of 1.75 cents. The average cost per passenger mile in 1926, 2.60 cents, was greater by 0.25 cents than in 1925.

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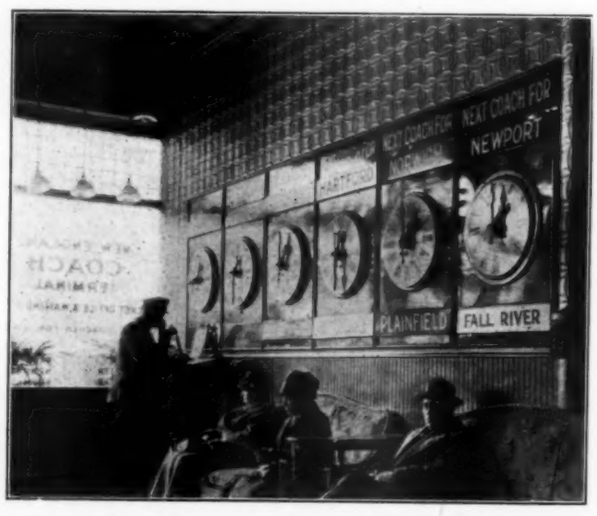
THE LONGEST continuous stretch of concrete roadway in the world has just been completed between White Bear and Duluth, Minn. This pavement passes through 29 towns and villages and is 137 miles long. Paving construction on this thoroughfare, State Trunk Highway No. 1, was begun in 1923. It is two miles longer than the concrete pavement extending from Olympia to Vancouver, Wash.




**Bus Departure Announcing Board, New England Transportation Company, Providence Waiting Room**

# Bus and Truck Design Hampered by Laws*

*Centering of power to regulate manufacture in state legislatures and lack of uniformity are troublesome*

By D. C. Fennert and M. C. Horine††

LEGISLATIVE activity in relation to the automotive industry has gained a sufficient measure of momentum today so that it is now properly the intimate concern of practically all elements of the automotive industry. Quite naturally it has centered chiefly about the larger and heavier vehicles and those which are engaged in common carrier service. These are today minor elements of our industry; but in their potentialities they represent the most promising field for future development, so that the effect which legislation is having and bids fair to exert on these classes of products should be of particular concern to the automotive engineer.

Buses have been subjected to the greatest amount of legislative restrictions of any type of motor vehicle for while trucks have been seriously affected by size and weight limitations, buses have suffered from similar restrictions and, in addition, in many states, from exceedingly complicated and conflicting structural limitations which have seriously interfered with the interstate use of buses and the standard construction of chassis, bodies and equipment.

Unfortunately much of this regulation has been in the form of legislation so that modification in view of developments is a difficult and tedious operation. In respect to maximum weight, six states permit 28,000 lb. gross while two states have as low a limitation as 15,000 lb. Regarding length, three states permit as much as 40 ft. while two limit the maximum to 28 ft. The total width varies from 102 in. in one state to 84 in. in two others. Thirteen feet total height is allowed in one

*From a paper presented at the meeting of the Society of Automotive Engineers at French Lick, Ind., May 25 to 28, 1927.

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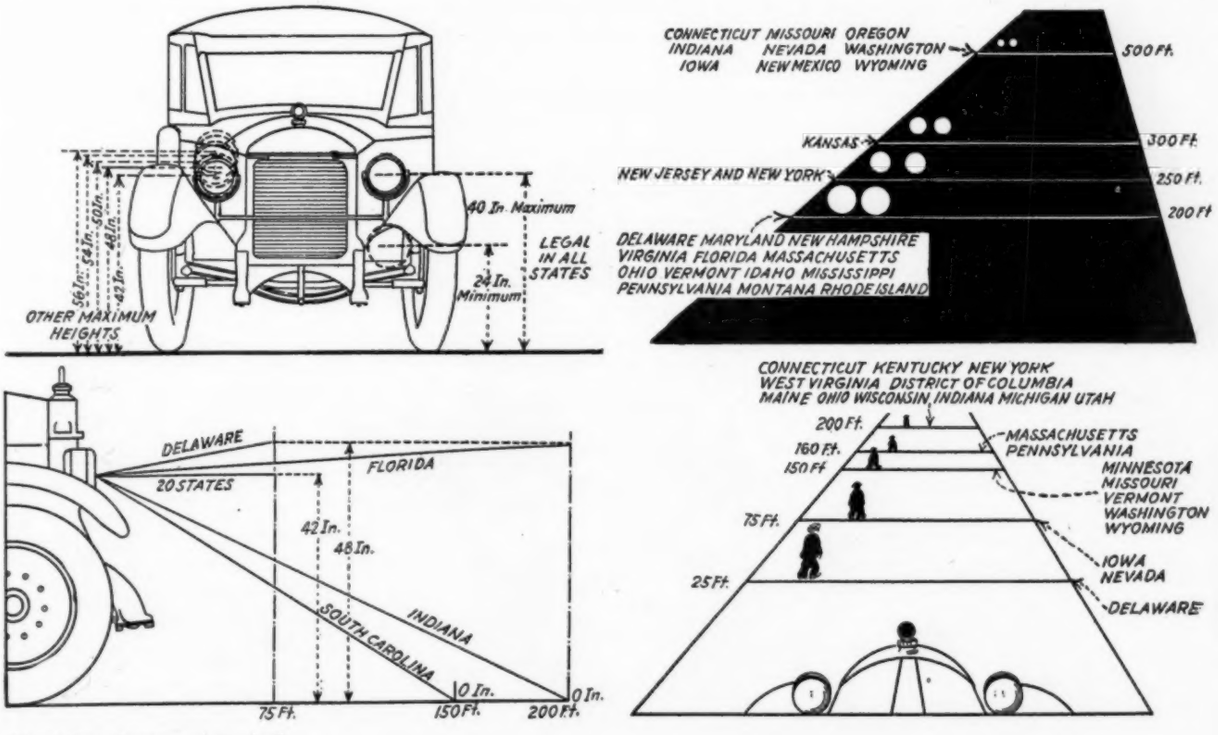



*Illustrations Courtesy of S. A. E.*

**Graphic Presentation of Variations of State Headlighting Requirements and Restrictions**

(Upper Left) Minimum and maximum permissible height of head-lamps above the road. Any height from the minimum of 24 in. to the maximum of 40 in. is legal in all states. Only one state, Oregon, has fixed minimum. Maximum heights are fixed as follows: 40 in. in Wisconsin; 42 in. in Indiana, Missouri, Idaho and Nevada; 48 in. in New Mexico; 50 in. in Oregon; 54 in. in California, and 56 in. in Connecticut and New Jersey. (Upper Right) Distances at which head-lights must be visible from in front. The minimum distance is 200 ft., as required in the 14 states indicated in the foreground. In New York and New Jersey the minimum is fixed at 250 ft.; in Kansas as 300 ft., and in the nine states indicated at the top, mostly Middle and Far West states, at 500 ft. (Lower Left) Maximum permissible height of head-lamp beam. Twenty states provide that the top of the concentrated beam shall not rise above 42 in. at a distance of 75 ft. ahead of the lamps. Delaware permits a height of beam of 48 in. at 75 ft.; South Carolina requires that the beam shall not rise above the surface of the road at 150 ft., and Indiana that it shall not rise above the surface at a distance of 200 ft. (Lower Right) Distances at which objects must be made visible. Ten states and the District of Columbia fix this at 200 ft.; Massachusetts and Pennsylvania at 160 ft.; Vermont, Missouri, Minnesota, Wyoming and the State of Washington at 150 ft.; Iowa and Nevada at 75 ft. and Delaware at the minimum distance of only 25 ft.

state; three others limit it to 12 ft. A further dimensional complication is found in the New Jersey regulations which limit the body length to 24 ft.

There is a marked tendency for regulations of this sort enforced in one state to be written into the fixed laws of other states. One of the most troublesome requirements is that covering the emergency door. The experience of manufacturers and operators has resulted in general agreement that the best location for the emergency door is on the left side of the rear, yet in three states, for some time, this type of emergency door has not been legal and it has been necessary for manufacturers to build special types of bodies with the emergency door at the center of the rear for these states.

There is great disagreement in the various laws and regulations concerning the location, arrangement, number and color of marker lights. Three states require a yellow stoplight despite the fact that all other states either ignore its color or require red. Braking requirements in some of the states, while somewhat ambiguous, seem to bar definitely a popular arrangement of four-wheel brakes wherein the pedal actuates all four brakes, the hand lever acting on the rear wheel brakes only.

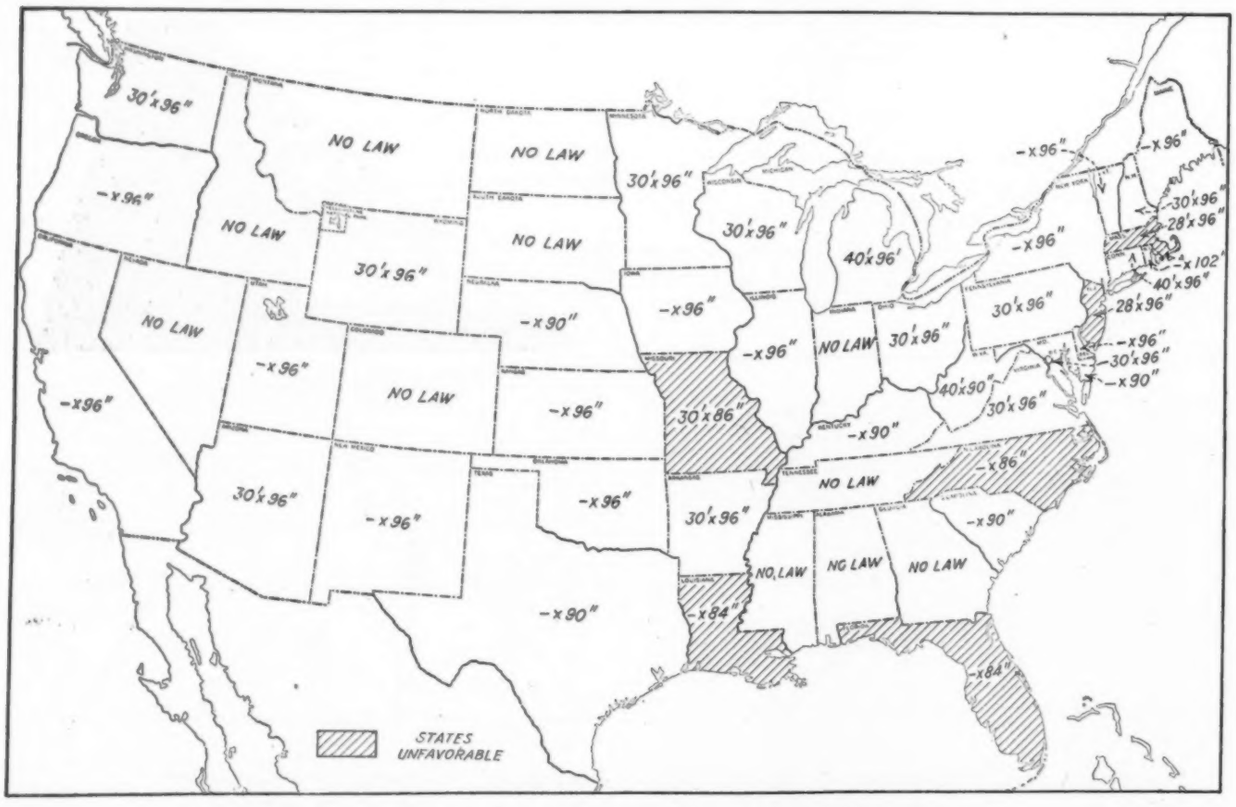
## Bus Outlook Hopeful

The general outlook on bus regulation, however, is hopeful as is evidenced by the recent modifications of the New Jersey regulations. A great many of the more troublesome requirements in the old regulations were satisfactorily modified in those recently put in force. All bus manufacturers today are obliged to give very careful consideration to legislation in the various states in all of their design work and in the selection of bus equipment. The lack of coherent uniformity has acted as a severe handicap on design development, for not only do the present statutes and regulations discourage development and enterprise along new lines but the threat of further adverse developments acts as a deterrent, even where the way seems clear. Indeed, to be competent to design, a bus today, a man needs not only to be a peculiarly resourceful engineer, but he also needs to be something of a lawyer, perhaps even a lobbyist.

## Trucks Are Sufferers

The effect of restrictive legislation on motor trucks and motor truck design has had a more specialized and more profound effect upon the very economic fundamentals of truck transportation. Undoubtedly the greatest effect of these laws has been to discourage the building of one of the most economical types of transport vehicles, namely, large capacity, heavy-duty trucks. Practically all states today impose definite restrictions on this type, either in the form of limitations of gross weight, vehicle weight or carrying capacity. In addition to this, practically all of the states grant discretionary powers to the state highway departments for local jurisdiction to modify state-wide limitations on certain roads or at certain seasons of the year. These discretionary powers are usually exercised during the spring of the year when the highway sub-grades have become softened due to the frost coming out of the ground.

The state regulations regarding speeds, lighting equip-




**Maximum Length and Width of Vehicles Permitted in the Different States**

The first figure in each state is the over-all length of single vehicles in feet, and the second figure the over-all width of body and load in inches allowed by state law. Where a dash takes the place of the first figure, the law does not limit the length of a single vehicle. For a combination of vehicles and an over-all length of 60 ft. is allowed in Michigan, West Virginia and Missouri; of 65 ft. in Illinois, and of 85 ft. in New Hampshire, Rhode Island, New Jersey, Virginia, District of Columbia, Pennsylvania, Ohio, Minnesota, Wyoming and the state of Washington. The shortest permissible maximum length of a single vehicle is 28 ft. in Massachusetts and New Jersey; and the narrowest permissible width of body and load is 84 in. in Florida and Louisiana, and 86 in. in North Carolina and Missouri. The last six states are shaded to indicate unfavorable size limitations.

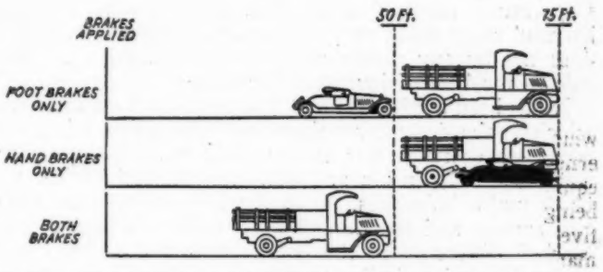
ment, total width and height are as a rule not troublesome. It is the regulation of gross weight in one form or another which has been most drastic in its effects upon motor truck design and operation.

### Saving the Highways

The weight limitation situation arises, of course, from the desire on the part of public officials to prevent rapid destruction of highways as a result of the operation over them of vehicles for which the highways are unsuited. The general impression prevails that a vehicle is destructive to a highway in proportion to its weight, although most of the states give some consideration to the relative concentration of this weight by setting up limitations on the weight per inch of tire width; by placing limitations on weight per axle and in several cases by allowing additional gross weight to be carried where it is shared by more than two axles.

The impression seems to have prevailed that by limiting the gross weight which can be imposed upon the highway in this manner, enforcing such limitations by stringent check-up with scales and loadometers and the imposition of heavy fines for violations, operators of trucks would be forced to confine themselves to light vehicles and loads and that the roads would thereby be preserved. Several important considerations, however, have been overlooked in reaching this conclusion and the general economic effect of these measures has not been sufficiently considered.

It is undoubtedly true that a great many of the roads throughout the country are incapable of standing up under any but the lightest traffic. It is also true that whereas roads can be built to support successfully the heaviest types of vehicles in operation, their cost per mile is so great as to render them economic only in certain cases. The principal difficulty lies in the fact that the economics of the situation involve the vehicles and the highway together and inseparably. To regard prevailing highway capacities as an arbitrary limitation on transport development is as short-sighted as to regard vehicle costs per ton-mile alone as the economic test.

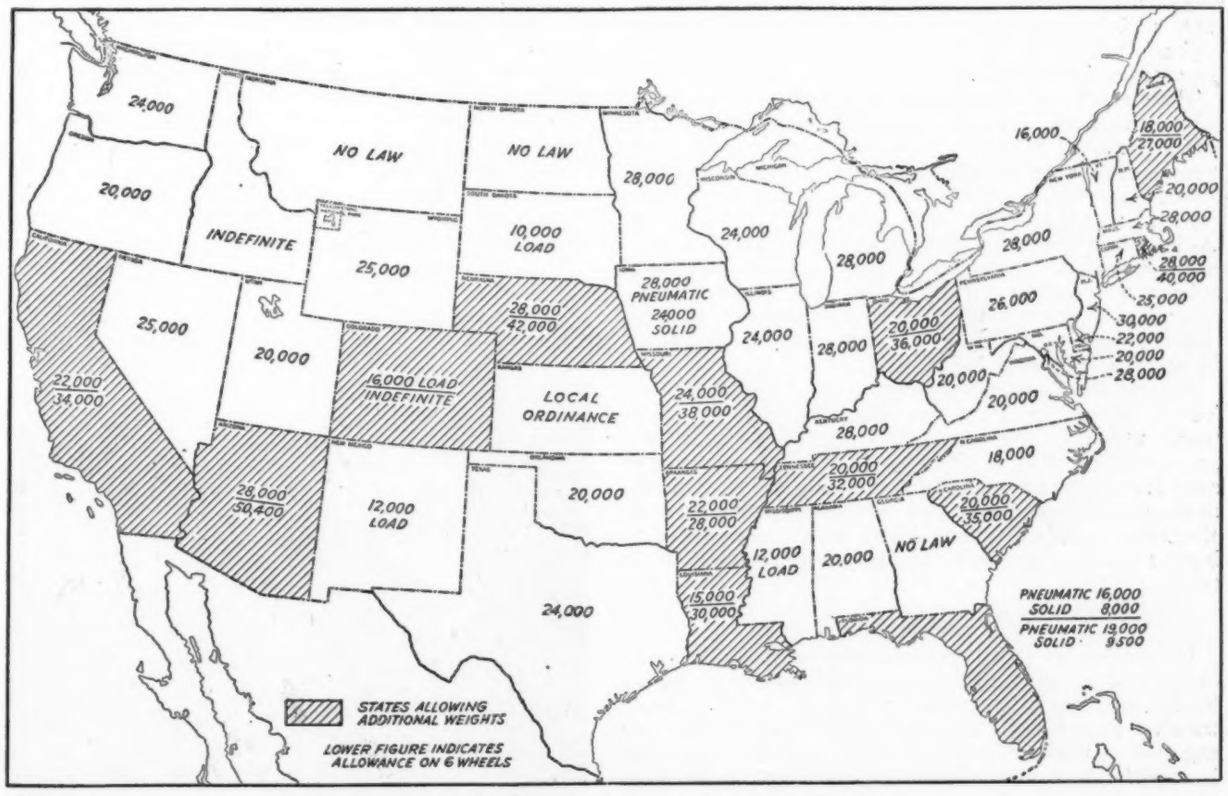



**Braking Requirements of Proposed Safety Code for Brake and Brake-Testing**

The code prepared for submission to and approval by the American Engineering Standards Committee as a standard to be urged for adoption by all states provides that from a speed of 20 m.p.h. the foot brakes alone shall stop a passenger car within 50 ft. and a motor truck within 75 ft.; that the hand brake alone shall stop either passenger car or truck within 75 ft., and that both foot and hand brakes shall stop a truck within 50 ft. after application of the brakes.

### Many Laws Lack Common Sense

The present laws affecting motor trucks are based largely on assumptions, many of which are at variance with scientific fact and economic common sense. As a result of more than eight years of continuous research




**Maximum Vehicle Weight Allowed in the Different States**

In the states where only one figure is shown, the figure is the allowable Gross weight of the vehicle and load in pounds, or of load only, as specified in Mississippi, North Dakota and New Mexico. The shaded states permit the larger gross weight shown in the lower figures to be carried on six wheels, or double the weight to be carried on pneumatic tires, as in Florida.

and experiment by the best qualified authorities on both highway construction and transport engineering, it has been definitely established that gross weight is by no means a fair measure of the road destructive potentialities of the vehicle. It has been clearly demonstrated by no less a body than the Bureau of Public Roads of the Department of Agriculture that static weight has no harmful effect upon properly constructed roads and this does not by any means confine the application of this rule to the best of improved highways.

It has been established that it is the impact on the road which is the destructive agent and that impact is governed by other factors than weight alone; speed, tire equipment, suspension and character of road surface all being major influences. It has been shown that the relative sprung and unsprung weight of a vehicle makes a marked difference in the impact delivered to the road under otherwise similar conditions. It has been shown that a truck of even moderate weight operated at excessive speed with high unsprung weight, stiff springs and tires worn thin or with portions of treads missing may produce a more destructive impact on the road than a truck of much greater gross weight in which these other factors are more favorable.

### Compulsory Overloading

In some states the restrictions on gross weight have been set arbitrarily at a figure which is just below that which would admit types of vehicles which are best adapted economically to certain classes of service. In other cases the maximum weights allowed are so low that nothing but the lighter delivery types of chassis can be used. One great defect in most of the weight laws is that no adequate provision is made to guard against overloading. The result has been that with the limited gross weight allowance, users have been encouraged to purchase unduly light types of chassis in order that large payloads might be carried while still remaining within the gross weight allowance.

There can be no question but that such practice is not only not economic from the operating standpoint but also that it is entirely within the range of possibility that such grossly overloaded vehicles will prove actually more destructive to the highways than would heavier chassis properly adapted to the loads imposed upon them. It has been said that some of these gross weight laws, such as the notorious Burke law in Ohio, are in effect compulsory overloading laws. In the state of New York, this phase of the matter has been so completely ignored that it is actually possible to license a 1-ton Ford truck for a gross weight of 28,000 lb.

Among the economic factors which have been overlooked is the important one that the types of heavy trucks which are the particular target of the legislators are operated chiefly in cities where they do not traverse state highways and where in many cases the street pavements are of such nature that they can have no destructive effect. This is because it is usually only close to large markets that large loads are available for single trips.

### New Developments

Of course, in the more populous sections trucks of heavy type are also used for so-called long-distance, intercity transportation where they do traverse main traveled state roads. In these cases, however, they are engaged in work of economic value and their operation is confined to a relatively small proportion of the state road system. Furthermore such portions of the state road systems are usually provided with the heaviest types of pavement, necessary because of the large volume of all kinds of traffic which they must sustain. As a general rule there is no occasion for truck operators to run the heavier types of truck into the districts where light type highways prevail.

Failing to persuade the legislators to increase the weight limits, motor truck interests in several of the states have been successful in getting through special concessions for multiple axle types such as tractor-semitrailer and six-wheel vehicles. This has given great impetus to the development of both of these kinds of equipment. Not all of the states have so far recognized the benefits of six-wheel vehicles, however, as 25 states and the District of Columbia permit no additional weight allowance, while two other states, Arkansas and Nevada, stipulate that the axles must be 96 in. or more apart for any additional allowance.

### Concessions for Pneumatic Tires

Reinforced by the findings of the Bureau of Public Roads with respect to the lower impact delivered by pneumatic tires as compared with solid tires on the same vehicle, earnest workers have been successful in getting several of the legislatures to approve higher gross weights or at least lower license fees on pneumatic-tired trucks. This in turn has led to a steady increase in pneumatic tire equipment on the heavier capacities.

Often in discussions of the effects of legislation on automotive design, where manufacturers discover themselves obliged to turn their attention to the production of greater numbers of lighter units to take the place of prescribed heavy units, the philosophy is advanced that the manufacturer really has no share in the controversy; that he can make as much profit from the sale of many light vehicles as from a lesser number of heavy ones; that the general public is the loser after all; that it is the general public's battle. That would be all well and good if the public were obliged in all cases to use motor transport regardless of its efficiency but it should be perfectly apparent that if the misguided zeal of shortsighted and uninformed legislators is allowed to militate too far against economic highway transport, then much of the traffic that should and normally would fall to automotive vehicles for transportation will revert to the older forms of transportation and we in this industry will thereby be made to bear our share of the burden. What this industry needs is less legislation in engineering and more engineering in legislation.

* * * *

**White Trucks Used in Lieu of Cars in Akron Grade Crossing Elimination**

# Uniforms and Drivers' Performance

*Most railways require such outfits—Various types described*

OF 12 railways replying to questions regarding their practices with respect to uniforms for their motor bus drivers, 8 have stated that they require their drivers to wear uniforms while 4 do not do so. The eight companies requiring their drivers to wear uniforms are the Nashville, Chattanooga & St. Louis Motor Transit Company, the Copper Range Motor Bus Company, the Baltimore & Ohio, the Chicago, North Shore & Milwaukee, the Santa Fe Transportation Company, the Northland Transportation Company, the Canadian Pacific Transport Company, and the New England Transportation Company. The four companies whose drivers are not required to wear uniforms are the Rutland Transportation Company, the SamOset Company, the Utah Parks Company and the Norfolk Southern Bus Corporation.

### Drivers Pay for Uniforms

All of the eight companies requiring their drivers to wear uniforms also require that they pay for them. Ordinarily this is done by deductions from the pay of the drivers until the cost of the uniform has been defrayed. On the Nashville, Chattanooga & St. Louis, payments for the uniforms are made easy by small monthly deductions from their pay. The Copper Range Motor Bus Company purchases uniforms for its drivers and the drivers pay for them on a partial payment basis in three months' time. Drivers on the Chicago, North Shore & Milwaukee buses pay for their uniforms at the rate of $5 per pay day, while those employed by the Santa Fe Transportation Company have $8 per month deducted from their pay checks.

Uniforms for its drivers are purchased by the Northland Transportation Company and the drivers pay for them through deductions in three equal installments from their salaries, provided the drivers do not wish to pay cash for their uniforms. Bus drivers of the Canadian Pacific Transport Company are uniformed the same as passenger trainmen, the uniforms being provided at the rate of two per year on the basis of the driver paying half and the company half.

Operators of New England Transportation Company buses pay for their uniforms at the rate of $5 per week, this amount being deducted from the weekly payroll. The cost for coat, breeches, puttees and cap ranges from a $35 minimum to $38.50, according to the size of the man.

### Uniforms Described

N. C. & St. L. drivers wear uniforms consisting of khaki breeches and military coats. A military type cap is worn which has a metal insignia on the front lettered "N. C. & St. L. Motor Transit Company." Leather puttees are also worn.

Copper Range drivers wear uniforms of Oxford gray, the material being all-worsted whipcord. The uniform consists of a Norfolk coat, breeches and puttees, without trimming. The caps, which are of dark gray whipcord, have a plain band lettered "C. R. M. B. Co."

Uniforms of the drivers of Chicago, North Shore & Milwaukee buses are olive drab in color, the coats being single-breasted. The brass buttons and lapels bear the "N. S. L." monogram. Tan shoes and puttees are worn and the caps are of the military type without a wire in the top.

The standard uniform for bus drivers of the Santa Fe Transportation Company is a dark brown whipcord worn with a wide brown leather belt and puttees.

"Indian Detour" drivers are dressed in riding trousers, riding boots and brightly colored shirts with a neckerchief. They also wear large Stetson hats.

The Northland Transportation Company drivers' uniforms are dark navy blue in color and bear no trimming other than light metal buttons and a silver cord around the cap. The coats are belted only in the back. It is optional with Northland drivers as to whether or not they wear breeches or trousers.

Drivers' uniforms required by the Canadian Pacific Transport Company are of blue serge with a three-button coat and blue serge caps.

The drivers of the New England Transportation Company wear olive drab uniforms, a lighter cloth being used in the summer uniforms than in the winter uniforms. The caps are of the same material as the uniforms and have a curved visor. On the right arm of the driver's coat, the initials "N. E. T." are embroidered in gold, the cost of this, 65 cents, being paid by the company.

### Require Clean Uniforms at All Times

Without exception, railway bus companies are strict in the requirement that their drivers keep their uniforms clean and in good repair at all times. Cleaning and pressing is not required at any stated interval, this being left largely to the discretion of the driver. The cost of cleaning and repair is assumed in nearly all cases by the drivers themselves.

The only company with a practice differing in any way from that described is the Northland Transportation Company. The Northland pays the salary of a man to do the dry cleaning of its drivers' uniforms and the shining of their boots and shoes. A charge of one dollar per month is made to the drivers for this service, this being deducted from their pay checks. The uniforms of its drivers can be dry cleaned at a reduced rate as the cleaner does all the pressing. The Northland has not established a fixed interval at which its drivers' uniforms must be cleaned.

### Uniforms Affect Drivers' Performance

Most of the officers of railway bus companies agree that attractive uniforms on their drivers affect the drivers' performance of their duties favorably and also affect favorably the amount of traffic carried on their buses.

"We believe that the uniforms on drivers," says G. H. Wescott, president and general manager of the Copper Range Motor Bus Company, "do affect their performance of their duties favorably, although it does not affect the amount of traffic we secure as our condition is somewhat different from the ordinary as we have no competition."

Drivers employed by the Fifth Avenue Coach Company, which operates the motor bus service of the Baltimore & Ohio in New York and vicinity, wear attractive uniforms and when it undertakes other bus operations the B. & O. will make the same requirement of

its employees. "It is my personal opinion," says M. F. Steinberger, special engineer of the Baltimore & Ohio, "that drivers should be attractively uniformed, as undoubtedly that has some bearing on their personal efficiency and also very probably helps in the securing of traffic.

The average person would undoubtedly prefer to ride in a spotless coach with a properly uniformed driver rather than in a coach driven by a man of slovenly appearance."

"The appearance of a driver," says F. A. Klock, assistant manager of the motor coach department of the North Shore Line, "has a great deal to do with the confidence of the public in his ability as a driver."

"It has been our experience," says R. H. Clarkson, manager of the Santa Fe Transportation Company, "that when drivers are neatly dressed the tendency is for them to keep their equipment clean and polished.

F. S. Hobbs, manager of the New England Transportation Company, agrees that attractive uniforms affect favorably both the performance of bus drivers and the amount of traffic attracted to the buses, and C. E. Wickman, president of the Northland Transportation Company, expresses a similar thought.

### Changes Adopted

Two roads, the North Shore Line and the Northland Transportation Company, with relatively long experience in bus operation have made certain changes in their drivers' uniforms since the original ones were adopted. The caps worn by North Shore Line drivers were originally modelled with a wire in the top but as a result of a popular vote of the drivers this wire has been removed.

### Tries Several Styles

The Northland Transportation Company has made several changes in its uniforms with respect to both color and quality. It has tried four different colors in the past two years and has finally decided on a dark navy blue as being the most practical for all purposes. According to Mr. Wickman, it also had some trouble with the quality of material furnished by different uniform companies in that they evidently contained too much cotton and did not stand up under the wear that they received.

### Reasons for No Uniforms

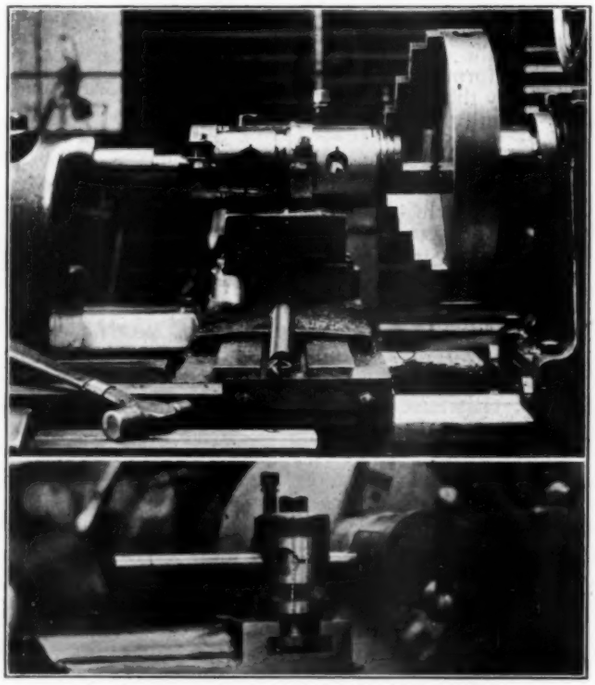
Two of the roads whose bus drivers do not wear uniforms have stated their reasons for not making this customary requirement. According to G. L. R. French, assistant vice-president and general manager of the Rutland, a driver's uniform is not required but a uniform cap is furnished at the expense of the company. The bus line traffic is entirely of a local nature, the service being a substitution for mixed trains which have been discontinued. Taking in consideration the small number of passengers carried in the sparsely settled communities which the bus line traverses, it was not thought that an attractive uniform would increase the patronage.

The Utah Parks Company, the bus operating subsidiary of the Union Pacific serving the national park district in southern Utah, has not specified a regular uniform for bus drivers on account of the long drives and heat experienced along its route. "Our operation is somewhat different from most operations," says G. R. Parry, superintendent of motor transportation. "As we have a run of about 500 miles our passengers as a rule dress in hiking and outing clothes. We have found that it is more advisable to let our drivers dress in comfortable, loose-fitting trousers, light shirts and no coats. We are now considering a standard uniform."

## Chamfering Piston Heads

THE usual method of cutting the chamfer in piston heads is to chuck the piston on a lathe and then feed the tool by hand. This is a tedious method which requires the skill of an experienced machinist. This method was used when piston heads were chamfered in the New England Transportation Company's Providence, R. I., garage when it first went into operation. The machinist doing this job later worked out a scheme of automatic feed with the result that he increased his production from six to eighteen piston heads in eight hours. First he took an old piston and machined one end of it so that it would fit snugly into the open end of the new piston. The other end was centered to fit the tailstock center of the lathe. Next, a template or cam was made to fit around the dummy piston. The template is held in place by two sheet metal clamps.

A valve lifter roller was fitted into a slot cut in one end of a ¾-in. Armstrong boring bar toolholder. As shown in the illustration, the Armstrong toolholder is



**Upper, Two Pistons in the Lathe and Spring Which Actuates Tool Cross-Slide—Lower, Roller Bar in Position**

placed in the tool slide beside the cutting tool post. When the roller passes over the template the cutting tool is withdrawn from the piston.

The next step was to devise a means so that the tool cross slide would move the cutting tool to and from the work. The tool cross slide was loosened and a stop set in place to regulate the depth of cut. A coil spring was attached to the rear of the slide and the rear of the lathe. Thus, as the roller passes over the template, the spring is in tension, and when the roller leaves the template the spring returns the cross slide to the cutting position.

In setting up the job, the new piston is centered in the lathe chuck. When the dummy piston is put in place its wrist pin hole is lined up with the wrist pin hole in the new piston. The tool is set to cut the proper depth, after which the lathe cross feed is thrown in gear. The template on the dummy piston acts as a cam and withdraws the cutting tool.

# Good Brakes Essential in Buses and Trucks*

*Efficient, long life obtained through proper design in all details—New developments discussed*

By H. D. Church
Director of Engineering, the White Company, Cleveland, O.

AS a loaded 21-passenger motor coach weighs 13,000 lb. maximum, and a 29-passenger motor coach weighs 18,000 lb. maximum, the problem of obtaining satisfactory wheel-brakes is a serious one from the standpoint of effectiveness, life and heat dissipation. During our development work on internal brakes we have never been able to obtain a complete reconciliation between theory and practice. Probably the theories we used were wrong. Consequently, the brakes we are now using represent an empirical development, and I can do no more than to point out the features which have made the design practicable, as well as some of the pitfalls to be avoided in the design of brakes of this type.

Early in our development work, after various experiments with expanding-band and multiple-shoe brakes, we decided that the simple two-shoe internal-expanding combination represented the most practical solution of the problem; therefore we concentrated on this type. We were fully aware that this type of brake has certain drawbacks, such as a relatively low percentage of 360 deg. of lining contact, but in our opinion the disadvantages are relatively unimportant among considerations affecting the final results that are attainable.

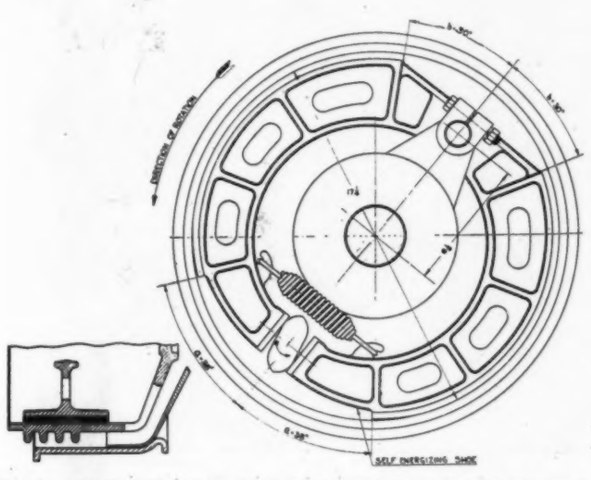



**Fig. 1—Dimension Drawing of Two-Shoe, Internal Expanding Brake**

It is necessary to keep the body and chassis of a motor coach as low as possible, and for this reason the use of 20-in. rims is desirable. This limits the diameter of brake-drum that can be used, as the inner of the dual rear tires overlaps a large portion of the outside diameter of the brake-drum. This condition makes the braking problem more difficult in two ways: By limiting the diameter of the drum that can be used, and by masking the brake-drum so that the ability of the drum to dissipate heat is materially reduced.

On heavy high-speed vehicles under these conditions, it is obvious that if an approximately normal pedal-travel is to be maintained, some means must be provided to augment the effort of which the driver is capable. Also, from the standpoint of first cost and weight, it is desirable to eliminate the use of any servo mechanism, using this term in the commonly understood sense of a means external to the brake proper, for stepping up the force applied by the driver to the foot-brake pedal.

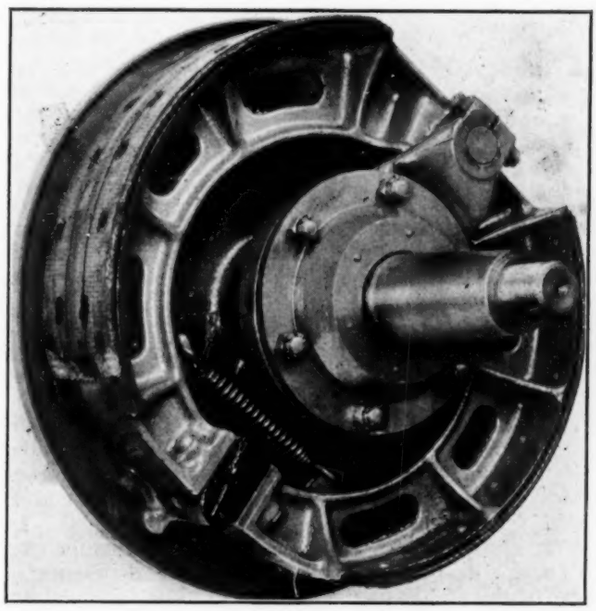


**Fig. 2—Complete Brake Assembly**

It is a well-known fact that in a two-shoe brake of the internal-expanding type, the shoe upon which the direction of rotation of the drum runs from the cam end toward the hinge end, possesses self-energization characteristics. A dimension drawing of a brake of this type is shown in Fig. 1. Figure 2 is a photograph of the complete brake assembly.

### Objects in Brake Design

The objects to be attained in connection with the design of a brake of this type can be briefly stated as follows:

(1) The maximum degree of self-energization that will not "grab" or give roughness when using a brake-

* From a paper presented at the meeting of the Society of Automotive Engineers at French Lick Springs, Ind., on May 28.

lining having the highest coefficient of friction of any that is obtainable on the open market.

(2) Ample braking effect and ability to hold equally well with either direction of drum rotation.

(3) Uniformity of brake action throughout the life of the brake-lining.

(4) Satisfactory life, both of brake-linings and drums.

It will be noticed that the brake-drum shown in the

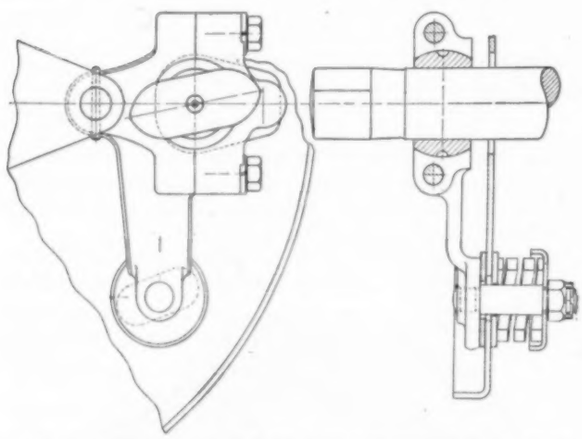


**Fig. 3—The Cam Is Mounted on a Floating Bell Crank**

upper right-hand view of Fig 1 is of somewhat heavy section and re-inforced by circumferential cooling-ribs, also that the brake-shoes are of extremely rigid design. In a brake of this type, the self-energizing shoe does considerably more work than the other shoe. This means that the lining of the self-energizing shoe wears more rapidly than the lining of the other, and unless some provision is made to compensate for this difference in wear the brake will become much less effective as the lining of the self-energizing shoe becomes worn. In order to overcome this condition by automatic means the cam is mounted on a floating bell-crank, one end of which carries the camshaft, while to the other end is fitted a frictional device, as illustrated in Fig. 3. In operation, the floating bell-crank simply permits the cam to change its position to compensate for difference in wear of the linings of the two shoes. The frictional device is made strong enough so that with the brakes released it will prevent the whole assembly from dropping into contact with the drum under the influence of road shocks. It must still be sufficiently free so that when the brake is applied the bell-crank can move and let the two shoes adjust themselves according to the relative lining wear.

The vital dimensions and angles of this brake, given in Fig. 1, show the actual construction as used on our 16 to 21-passenger motor coaches. The width of lining is 4 in. The rear tires are 34 in. by 7.50 in., low-pressure, with a loaded rolling radius of 16.76 in. The allowable gross weight of this vehicle is 13,000 lb., and it is capable of road speed of over 50 miles per hour.

The mechanical advantage between the pad of the foot-brake pedal and the point of contact of the brake-cam with the brake shoes is 47 to 1. With this ratio the pedal pressure required to slide the rear wheels is not inordinate, but because of the frequent stops made by the usual motor coach, it was considered advisable this model to lower the required pedal-pressure materially by the use of a vacuum booster-cylinder in the line. This is a refinement rather than a necessity.

In service, the brake is equally effective in either direction. Starting cold, repeated applications will cause the initial pedal travel to increase somewhat, because the drum expands in advance of the shoes. This is due to the heat-insulating qualities of the conventional brake-lining. As the shoes warm up, the pedal travel returns to normal. We find that one lining of the upper or non-self-energizing shoe will usually outwear two linings on the lower shoe. Under what might be termed average road conditions, such as between Cleveland and Buffalo or Columbus and Cincinnati, our customers obtain approximately 20,000 miles of service before it is necessary to reline the lower shoes. During our own original road-test work we averaged from 23,000 to 24,000 miles with one brake application every nine-tenths of a mile before relining the lower shoes.

### Cast Iron Brake Drums

An interesting fact in connection with the life of the brake-linings is that we have for some time been using with great success a somewhat unconventional material for the brake-drums, namely, a high-grade cast iron. This material was decided upon after a long period of experimentation with steel drums varying in carbon content, some running as high as 0.7 per cent, with various malleable irons and with special alloy combinations. Contrary to our early expectations, the cast iron is less affected by dirt than any of the other materials we experimented with. It resists wear to an astonishing degree, and in service acquires a mirror polish. There is no tendency for small particles of the brake-drum surface to be "picked off" and imbedded in the lining, thus scoring the drum surface. While cast iron presumably

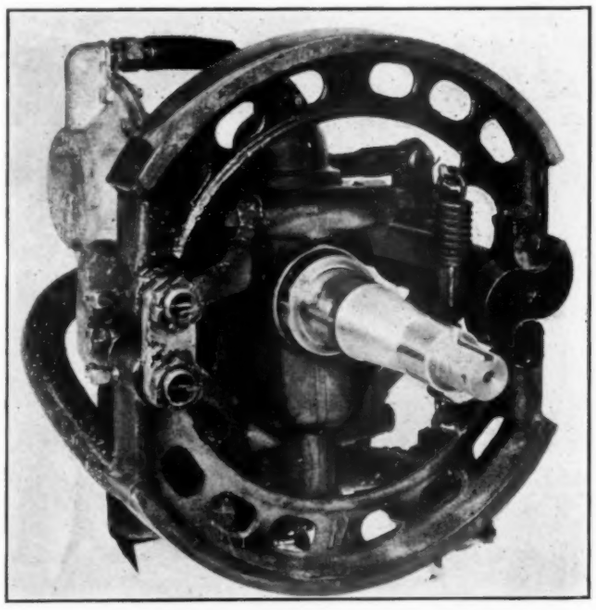


**Fig. 4—Rear Wheel Brake Construction**

has a lower co-efficient of friction than any of the other materials tried, it has made no appreciable difference in brake performance.

The same type and size of brake is used without a vacuum booster on our two-ton truck, which has an allowable gross weight of 13,000 lb. With the same drum diameter, but with a wider face, it is used on our 2½ ton truck, having a gross-weight allowance of 17,000 lb. In this application the mechanical advantage between the pedal pad and the point of contact of the brake cam with the brake-shoes is 51 to 1, giving a normal

pedal travel with sufficient freedom from brake adjustment. The rear tires are either 36 in. by 8 in. single solids, or 34 in. by 7 in. dual high-pressure pneumatics. The muscular force required at the pedal of this 2½ ton truck is as high as we feel can safely be depended on. In order to handle greater gross weights it will be necessary to add some form of servo mechanism.

### Two Important Points

On any vehicle where high braking effect is required, it is most important that two other points in addition to

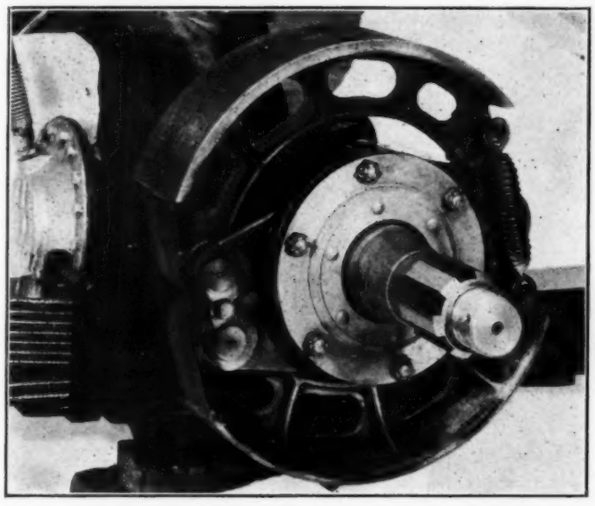


**Fig. 5—Front Wheel Brake Construction**

the design of the brake itself be given careful attention. All the connections between the brake pedal and the working surface of the brake cams should be made sufficiently stiff so that under maximum application of pressure all deflections are kept down to a reasonable amount in order to avoid unnecessary loss of effective travel. This applies to deflections both in bending and in torsion. Torsional rigidity is particularly important in the intermediate brake-shaft extending across the frame when the pull from the pedal is applied at the left and the pull to the brakes at the two ends. If this shaft is too light the resulting braking effect, even with an equalizer, is greater on the left brake than on the right.

The other point to be watched is the question of the proper geometry of the brake linkages between the frame and the levers on the rear axle. These should be worked out so that for the full range of spring travel there is the minimum effect either on the brakes or the brake-pedal. Otherwise effective pedal travel is again lost.

### Problem with Large Motor Coach

The most difficult brake problem of any that we have encountered was on our 25 to 29-passenger, six-cylinder motor coach. This vehicle has a maximum allowable gross-weight capacity of 18,000 lb. and is capable of over 60 miles per hour on the road. It is fitted with 38 in. by 9 in. low-pressure tires that require 20 in. rims. Consequently the maximum allowable internal-brake diameter is 17¼ in., the same as on the smaller motor coach.

In order to obtain proper deceleration with maximum brake life, it was decided to use brakes on all four wheels. On a vehicle of such weight and speed this involves some form of servo mechanism, and the Westinghouse system was adopted. The construction of the rear-wheel brake is shown in Fig. 4, and of the front-wheel brake in Fig. 5.

These brakes are of the internal-expanding type, but differ from those used on the small coach in that advantage has been taken of the greater pressure available from the Westinghouse system to eliminate brake-linings, using metal-to-metal braking surfaces. Except that no friction linings are used, the various factors affecting self-energization in these brakes are exactly the same as in the smaller motor coach, but owing to the added application force made possible by the use of compressed air there is no necessity to add a self-centering feature by floating the cam. The application force due to the compressed air is sufficient to give proper braking, even without using the self-energizing feature of the shoe.

Consequently, when the self-energizing shoe is worn to such an extent that it has less positive contact with the drum it is only necessary for the operator to depress the break pedal further, thus applying higher air pressure at the brake camshaft diaphragm.

The brake surfaces are metal-to-metal, no liners being used either in the drums or on the shoes. Both drums and shoes are of cast steel, the drums having a high carbon content and the shoes a low carbon content. This combination of metals, together with the degree of self-energization obtained, gives very smoth operation. The drums and shoes are of what we term the "throw-away" type, so-called because they are used until worn out and then are scrapped.

### Ability to Dissipate Heat

One of the most important features of this brake is its ability adequately to dissipate heat. As no lining or liners are used, the brake-shoes as well as the brake-drums are available as heat reservoirs and radiators. In order to obtain the maximum cooling effect no shields are used across the inner face of the drum, so that there is a free circulation of air throughout the entire assembly. With this type of brake the brake-drums have cast openings, as shown in the upper right view of Fig. 1, to allow any accumulation of dirt or metal chips to escape from the inside of the drum. The use of these openings has materially helped in the elimination of drum and shoe cutting. As the action of this brake is not affected by any normal amount of water such as is encountered in wet weather driving over improved roads, the elimination of drum shields is perfectly permissible. Grease and oil in moderate amounts have no appreciable effect on the braking.

After almost two years' experience with metal-to-metal internal-expanding brakes, I am very strongly in favor of that construction. There is only one drawback from a passenger car viewpoint, and that is the slight noise made by the braking surfaces during operation. So far as that goes, I hear the friction-fabric faced external brakes on many of the new cars making a great deal more noise than do these metal-to-metal internal expanding brakes, and the noise is of a more unpleasant character, due to its pitch.

The fact that the metal-to-metal brakes are so constant in action throughout their life, irrespective of atmospheric or road conditions, results in the safest braking we know today. The internal-expanding type, properly designed, makes it possible to use the maximum available diameter inside a given rim, and if the metal-to-metal combination can be used there is the added benefit of a well-cooled brake for driving at high speeds or in mountainous country.

# N. E. T. Personnel Example of Rail-Highway Co-Ordination

THE co-ordination of railway and highway transportation which is being carried out by the New England Transportation Company and the New York, New Haven & Hartford is apparent not only in the operation of the transportation company, but also in its personnel, both official and otherwise. With few exceptions the officers of the New England Transportation Company are now or were formerly officers of the railway.

All of the executive officers of the transportation company have existing or earlier railway connections. A. P. Russell, president, is also vice-president in charge of real estate, taxation, valuation and public relations of the New Haven. Likewise, E. J. Phillips, vice-president of the transportation company, is an officer of the railway; and N. M. Rice, vice-president of the transportation company, is vice-president in charge of purchasing and stores of the New Haven. The treasurer of the transportation company, C. H. Knights, is assistant treasurer of the New Haven, and R. H. Palmer, auditor, is local auditor of the New Haven at Boston.

### Former Railroad Officers

The officers of the New England Transportation Company in charge of operation, maintenance and traffic are not actively in the service of the New Haven, as the executives are, but with few exceptions they are former New Haven employees. The manager of the transportation company, F. S. Hobbs, was formerly a division superintendent of the New Haven. D. B. Gearwar, assistant to the manager, was formerly in the purchasing department of the railway. Of the three superintendents in charge of the operation of the various divisions of the New England Transportation Company lines, two came to the New England Transportation Company from outside connections, while one was formerly connected with the New Haven. A. E. Stewart, superintendent of the Connecticut lines, and W. M. Gustin, superintendent of the Massachusetts lines, were those not formerly in railroad service, while H. M. Walker, superintendent of the Rhode Island lines, was formerly a trainmaster on the New Haven.

The traffic manager of the New England Transportation Company, H. Price, was formerly connected with the passenger department of the New Haven; but F. J. Swentzel, mechanical superintendent, had no earlier railway connection, having been formerly in the automobile industry.

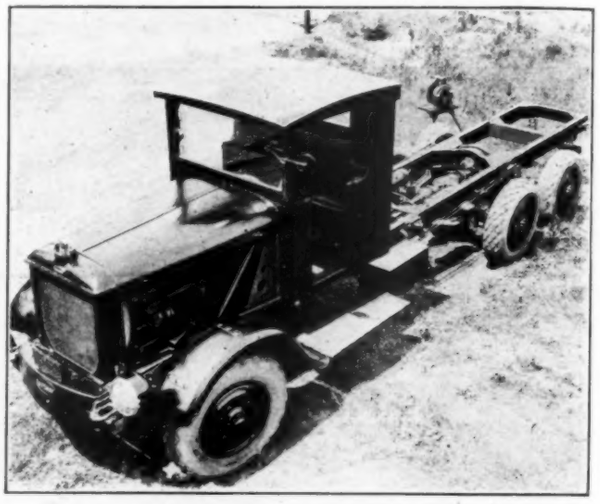
### Men in Ranks Also from Railroad

In addition to its officers the New England Transportation Company has some 300 employees in various capacities in the operating, mechanical and accounting departments, about one-half of whom were employed by the New Haven before being assigned to the transportation company. Practically all of the mechanical department employees were taken on from companies outside railway service.

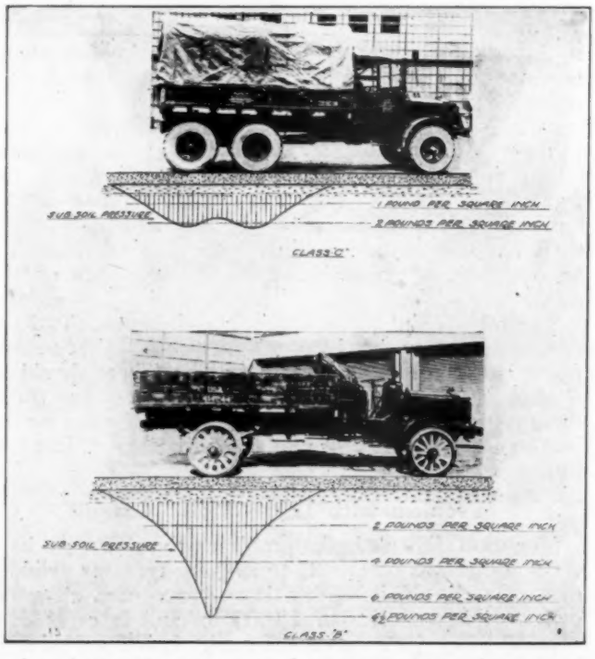
The directors of the New England Transportation Company are all officers of the New Haven. In addition to the president and vice-presidents, the other directors are F. C. Coley, passenger traffic manager of the New Haven; F. A. Farnham, counsel; J. O. Halliday, manager of transportation; B. I. Spock, general counsel; and R. H. Newcomb, who is assistant to the vice-president of the railroad.

# Six-Wheel Truck with Pneumatic Tires

THE purpose of the Six-Wheel Company, Philadelphia, Pa., in building a heavy duty six-cylinder, six-wheel vehicle is to make practicable the use of pneumatic tires on a motor truck by the weight distribution possibilities which the six-wheel construction affords. Tests made by the United States Bureau of Standards for the Goods Roads Bureau of the Department of Agriculture show that a six-wheel vehicle carrying a greater payload by three tons exerts only about 25 per cent of the impact applied against the pavement by the ordinary five-ton solid tired vehicle.



**A Four to Five-Ton Six-Wheel Truck Equipped with Pneumatic Tires**




**Results of Tests Made by the United States Bureau of Roads —Comparison of Sub-Soil Pressures, Each Vehicle Carrying 10,000 lb.**

The Six-Wheel Company has placed on the market a four to five-ton six-wheel truck equipped with pneumatic tires. The power plant is a Continental 14H, six cylinder, 4½-in. bore, 5¾-in. stroke engine with a 3-in. counterbalanced crankshaft having seven main bearings The motor develops 102 hp. at a governed speed of 1,800 r.p.m. Forced feed lubrication is used.

The gasoline is fed to the cylinder through a specially designed Stromberg carburetor. The manifold is equipped with a "hot-spot" designed to handle present-day fuel economically. A 45-gal. gasoline tank with welded joints is located under the driver's seat.

A truck style radiator with a vertical tubular core of sufficient size to cool the engine under adverse conditions is part of the equipment.

The clutch is the Brown-Lipe multiple dry disc type. Positive lubrication is provided for the clutch pilot and release bearings. The transmission is of the Brown-Lipe separate unit type, with a two-speed range giving seven speeds forward and two reverse.

The front axle is the Timken standard truck axle. The rear axle is the Timken worm and wormwheel type assembled in tandem under the Templin patent.

The hand and foot brakes operate independently on all four rear wheels through separate vacuum B-K boosters. The positive connection which is a feature of this type of brake, enables the operator to give additional power should the vacuum fail, in which case there is sufficient power to stop the truck by either the foot or hand brake alone. The four brake drums are 17¼ in. by 5 in.

The wheels are of the Budd-Michelin disc type, equipped with 8-in. pneumatic rims. High pressure 36-in. by 8-in. pneumatic tires are used on the front and rear wheels. The chassis is lubricated by the Myers magazine system which furnished oil to all the main working points. The oil is drawn from reservoirs by wicks to the bearings.

# A Link Belt Type Bumper

THE rapid increase in motor traffic on the public highways has developed the need for more complete bumper protection than that afforded by the spring bar type of bumpers now in common use. Bumpers of the spring bar type make an effective guard for the corners of the car and save the fenders and the finish, but they are of little value in a severe collision, and they are of no value in a side-swipe.

The bumper manufactured by the Belt Guard Bumper Company, Room 617, 110 West 42nd street, New York, has been developed to increase bumper protection and to withstand severe impacts with a minimum of injury to motor vehicles. This bumper may be applied on the front, rear and both sides of the vehicle. When applied to the sides as well as to the ends of a bus, complete bumper protection is obtained, side-swipes are rendered harmless and the locking of hubs is impossible.

The bumper consists of a belt extending partially or fully around the vehicle, supported by corner brackets in which it slides and by tension brackets at the ends. The belt is located on the clearance line of the vehicle and is spaced from the front wheels so as not to interfere with the steering movement.

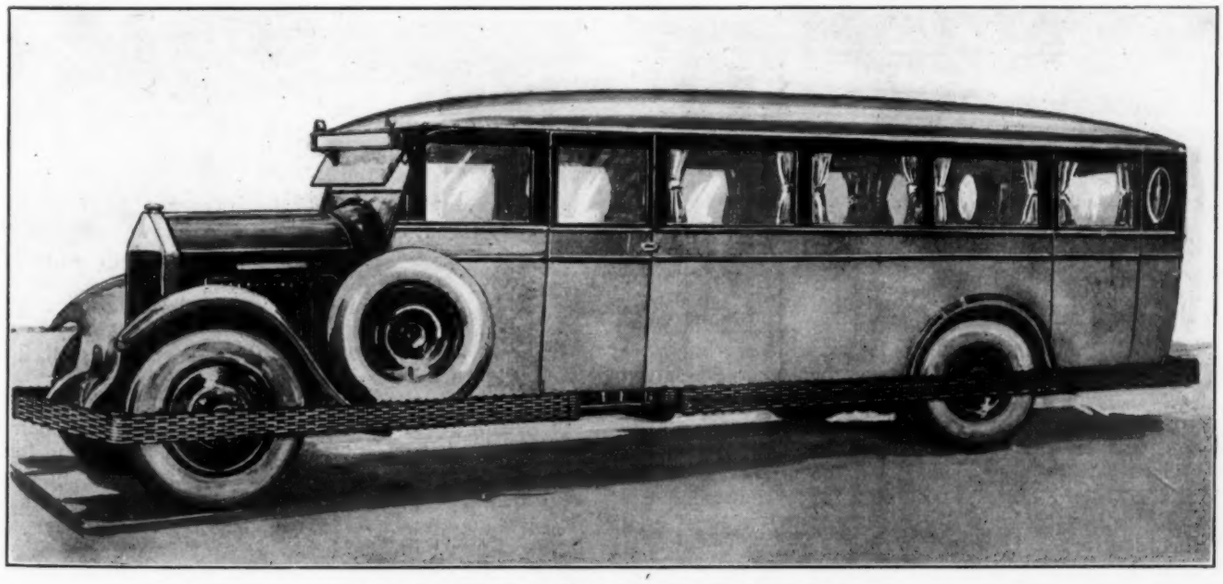
### Any Width Desired

The chain is formed on the link belt principle and may be of any width desired. The links are channel shaped with the flat face to the outside, thus securing strength without unduly increasing the weight. This provides a smooth, flexible surface to receive the impact. The tension on the brackets is adjustable. Provision is made for releasing and detaching the belt in sections by the use of a wrench. Thus, any part of the vehicle covered by the bumper is readily accessible.

This bumper, owing to its construction, is noiseless, cannot be dented or distorted out of shape and requires a minimum of space. It is particularly adapted for bus various makes of cars.

# Pennsylvania Adds to New York Freight Facilities

THE Pennsylvania has augmented its freight facilities in New York by the opening of an eastbound inland station, a westbound inland station and a constructive freight station. As reported briefly in the news columns of the Motor Transport Section of



**A Link Belt Bumper Which Protects All Sides of the Bus**

June 25, a contract has been awarded to the United States Trucking Corporation for the handling of freight by motor truck between the Pennsylvania freight terminal at Jersey City, N. J., and the inland and constructive stations. The arrangement is similar to that made by other railways in New York and the service replaces in part the handling of freight by car float through pier freight stations on Manhattan Island.

The eastbound inland station is known as the Laight-West street station, located on the south side of Laight street, between West and Washington streets, New York. It will be operated as a delivery station for all kinds of eastbound freight, except fresh fruits, fresh vegetables, dairy freight, raw silk and other restricted articles shown in Rule 25 of the New York Harbor Tariff. The westbound inland station, known as the Watt street station, is located at the northwest corner of Washington and Watt street, and will be used as a receiving station for all kinds of westbound freight except the same restricted articles.

### Location of Constructive Station

The constructive station will be known as the Cortlandt-West street station and will be located at the New York entrance of the Holland Vehicular Tunnel and the Cortlandt and Desbrosses street ferries of the Pennsylvania on the New York side of the North river. This station will be open for the delivery and receipt of all kinds of freight in carloads except the restricted articles mentioned above. Under this tariff the freight is loaded or unloaded to or from cars on Pennsylvania rails at Jersey City and trucked between Jersey City and the constructive station by the United States Trucking Corporation as agent of the railway. The trucking company does not act as agent of the Pennsylvania between the constructive delivery and receiving points and warehouses or stores of shippers or consignees, but under this plan shippers or consignees can make their own arrangement with the trucking company for transporting freight between their warehouses or stores and the constructive delivery or receiving points. New York freight rates apply to and from the above stations.

The United States Trucking Corporation is now using a daily average of 16 tractors and 64 trailers under this contract. The service has been in effect since June 1.

# Indiana Model 115 Two Ton Truck Chassis

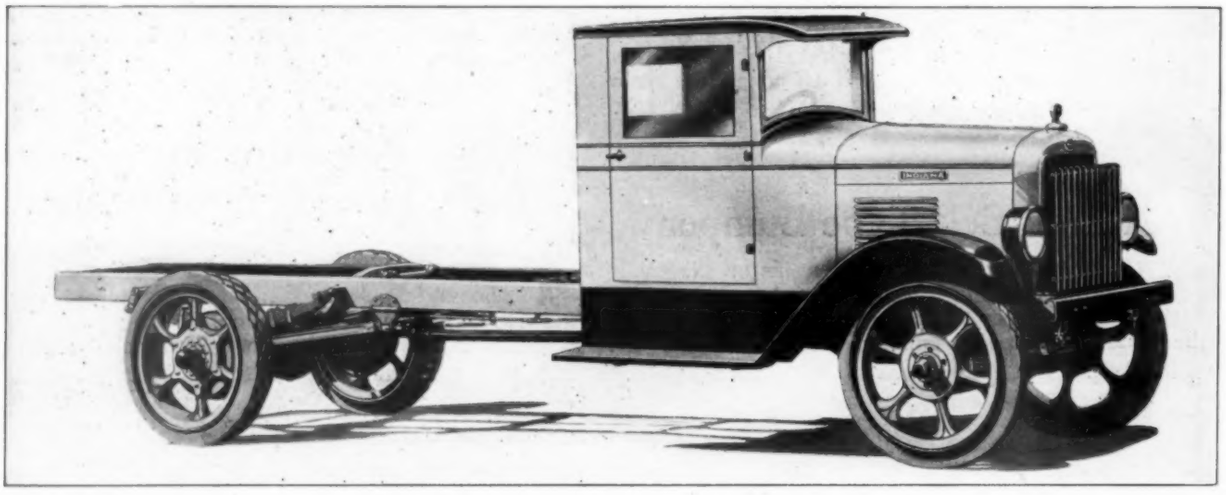
THE Indiana Truck Corporation, Marion, Ind., has developed a two ton truck chassis with a standard wheel base 150 in. It can also be furnished either with a long wheelbase of 168 in. or a short wheelbase of 132 in.

The chassis of this truck is furnished with a four-cylinder, 4-in. bore, 5-in. stroke L-head motor. The combined crankcase and cylinder block gives a rigid support to the crankshaft to assure alinement between the cylinder bores and crankshaft. The water jackets extend the full length of the cylinder barrels, forming a double cylinder wall.

This adds to the rigidity of the motor and in addition promotes even expansion of the block and permits closer valve clearance.

### The Transmission

The transmission is of the selective, sliding gear type, mounted in unit with the motor, four speeds forward and one reverse. The mainshaft and countershaft are mounted on taper roller bearings. The rear axle is the worm drive, semi-floating type. The worm is mounted at the forward end on a special roller bearing and at the rear end on two taper roller bearings, arranged to take the radial load and end thrust in either direction. The differential is also mounted on taper roller bearings. Driving power is transmitted to the differential by heavy lugs set in the worm wheel, which fit over the ends of the differential spider. No dependence, therefore, is put on the differential bolts for driving—these are merely for the purpose of holding the differential and worm gear assembly together.



Model 115, Indiana Two-Ton Chassis

The front axle is a drop forged I-beam section, 2 in. by 2¾ in.

The pressed steel frame which is 6⅛ in. deep, ¼ in. thick with a 3¼-in. flange, is mounted on silico-manganese steel springs. The front springs are 60 in. long, 2½ in. wide, 8 leaves; the rear springs are 50 in. long, 2½ in. wide, 15 leaves. The metal front and rear wheels have 60-in. treads. The rear wheels are equipped with internal expanding brakes 16 in. in diameter and 3¼ in. wide.

# Motor Transport News

THE FRED HARVEY COMPANY, which operates the bus lines of the Santa Fe Transportation Company for the Atchison, Topeka & Sante Fe, has been granted a certificate for the operation of a bus line between Williams, Ariz., and the Grand Canyon, a distance of approximately 75 miles.

THE NEW ENGLAND TRANSPORTATION COMPANY has refused the request of the Bristol, R. I., Town Council to honor commutation tickets sold at reduced rates by the New York, New Haven & Hartford for its trains on the Providence-Bristol route so long as trains are in service on the line.

## Certificates for S. A. L.

The Motor Transportation Company of the South, the highway subsidiary of the Seaboard Air Line, has been authorized by the North Carolina Corporation Commission to operate buses between Rutherfordton and Bat Cave (approximately 20 miles) and Rutherfordton and Boone (approximately 75 miles). Both these lines are extensions beyond the company's railroad lines.

## Columbia Buys Fidelity

The Columbia Terminals Company, St. Louis, Mo., has purchased the Fidelity Transfer Company of the same city, which like the Columbia Terminals contracts with railways entering St. Louis for the transfer of l.c.l. freight between their stations. Included in the purchase were 115 trucks, tractors and trailers, a freight station and other property. The Columbia Terminals Company now operates more than 500 units of motor equipment and is said to handle more than 90 per cent of the l.c.l freight transfer business in St. Louis and East St. Louis.

## Missouri Bus Law

Provisions of the new Missouri bus law, particularly with respect to the filing of rate schedules, were discussed on July 1 by a committee representing the steam railways operating in Missouri and Chairman T. J. Brown of the Missouri Public Service Commission. The committee was informed that the bus rates when filed will be open to the inspection of the public. The members of the committee were J. E. Hannegan, chairman of the Southwestern Passenger Association; J. M. Cornatzar, passenger traffic manager, St. Louis-San Francisco; H. E. Watts, passenger traffic manager, Wabash; and H. H. Butler, assistant general passenger agent, Missouri Pacific.

## Change in C. & S. Subsidiary's Certificate Order

Objections of the Denver & Interurban Motor Company, a subsidiary of the Colorado & Southern, and of the railway itself, to the order of the Colorado Public Utilities Commission, in connection with its grant of a bus line certificate covering the route between Denver and Boulder, that the Colorado & Southern must guarantee the operation and continue to hold a controlling interest in the subsidiary for several years, resulted on July 9 in an agreement under which the commission rescinded its order. Motor buses of the Denver & Interurban Motor Company have been operating over the Denver-Boulder route since December, 1926, when the Denver & Interurban electric railway ceased operation.

## Opposition to Railroad Bus Line

Although residents in the vicinity of the Alamosa Salida, Colo., bus line of the Denver & Rio Grande Western have petitioned the Public Utilities Commission to restore the rail service which was recently abandoned and replaced by bus service, no definite allegation as to the inadequacy of the present bus service is made. As the D. & R. G. W. has been operating this line for only a little over a month it is considered probable by officers of the railway that the objections to the bus service are based on the results of the usual difficulties encountered in the inauguration of service of this character. These matters are now being ironed out, and since the majority of the people in the vicinity of the line are favorable toward bus operation, it is felt that the regularity of service now being maintained will result in a withdrawal of the objections to the bus service.

## B. & M. Extends Bus Service

The Boston & Maine Transportation Company opened a bus line from Gardner, Mass., to Greenfield, operating a thorough car over the Mohawk trail, commencing June 25. This line combines train replacement with an appeal to tourists.

The company also about the same time purchased the line and equipment of the Wilcox Bus Company, operating between Greenfield, Mass., and Shelburne Falls and Charlemont. This equipment consisted of one Pierce Arrow bus, one Reo and one Studebaker and the Boston & Maine Transportation Company is operating on the same schedules and fares as the former owner. Acquisition of this line enabled the railroad to make some reductions in train service through this territory and permitted the coordination of rail and highway service.

Effective July 1, the Boston & White Mountain route was opened for the third time. This year the Public Service Commission of New Hampshire gave the right to carry passengers intrastate. For the past two seasons the White Mountain line has been operated on an interstate basis only. Buses are now operated in both directions via Crawford Notch and Franconia Notch, whereas previously northbound the buses were all routed via Crawford Notch and southbound, via Franconia Notch.

## Nebraska Commission Issues Bus Operating Rules

Thirty-five rules and regulations governing the operation of motor buses in Nebraska have been issued by the railway commission of that state, under authority granted by an act of the state legislature which became effective April 25. A uniform system of accounting will be set up later by the commission.

Each intercity bus line must secure the approval of the commission of its route and schedules, from which there must be no deviation without permission, except when roads are impassable. Changes in timetables cannot be made without permission and schedules must be posted at stations. The order requires that each company must carry liability insurance, the maximum liability to any one person being fixed at $50,000, but, in case more than one person is injured in one accident, being limited to $20,000 for buses of 12 passenger capacity or less, $40,000 for buses of 13 to 20 passenger capacity, $60,000 for buses of 21 to 30 passenger capacity, and $80,000 for buses of more than 30 passenger capacity. Property damage insurance of $1,000 is to be carried on each vehicle.

Included in the operating rules are provisions that buses must be brought to a stop at railroad crossings and that speed must be limited to 35 miles an hour. A maximum of 10 driving hours per day is prescribed.

## Southern Pacific Plans Another Bus Line

The Southern Pacific and its subsidiary, the Southern Pacific Motor Transport Company, have applied to the California Railroad Commission for permission to cease the operation of two local passenger trains between Sacramento, Cal., and Colfax, a distance of 53 miles, and have also asked that a certificate be granted permitting the operation of buses as a substitute for the steam railway service. According to the proposal of the motor transport company, four round trips daily between Sacramento and Colfax would be operated by the buses, doubling the present steam service.

The Southern Pacific Motor Transport Company began operations on July 1 on Boulder Creek- (California) Santa Cruz route. This company acquired this line by purchase of the Boulder Creek Stage Line, which had been in operation in this territory for 17 years. The route is 16 miles long and four daily trips are made; fare, 50 cents. The buses take the place of branch line train service and act as feeders to main line trains. The route lies in the heart of the Santa Cruz mountains and is described as difficult but of great scenic grandeur. For the operation the company has purchased two Mack 4-cylinder buses on which are mounted Duralyte Aisle suburban type bodies, built by the General Aluminum Products Company of Los Angeles, Calif.

## Orders for Equipment

THE PACIFIC ELECTRIC has received five parlor type buses from the Yellow Truck & Coach Manufacturing Company, Chicago.

THE NORTHLAND TRANSPORTATION COMPANY has ordered two type-Y parlor buses from the Yellow Truck & Coach Manufacturing Company, Chicago.

THE UNION PACIFIC STAGES has ordered two Mack 29-passenger, 6-cylinder, 233-in. wheel base parlor car buses from the International Motor Company.

THE NEW ENGLAND TRANSPORTATION COMPANY, highway subsidiary of the New York, New Haven & Hartford, has ordered seven Mack 230-in. wheel base 4-cylinder bus chassis from the International Motor Company. They will be equipped with Brown bodies.

THE SEABOARD AIR LINE has ordered one parlor car bus from the White Motor Company for the Motor Transportation Company of the South, its highway subsidiary.

THE SEABOARD AIR LINE has ordered for the Motor Transportation Company of the South one Mack 29-passenger 6-cylinder bus from the International Motor Company. The bus will have a Lang parlor type body and will be named the "General Robert E. Lee."

THE BOSTON & MAINE TRANSPORTATION COMPANY has just received delivery on nine new buses. Five are Type Y Yellows and four are 50-B Whites. All have balloon tires in the rear and the Yellow coaches also have them in front. All are equipped with Bender bodies.

THE SEABOARD AIR LINE has ordered one Model L 27-passenger parlor car bus and three Model M urban coach buses from the American Car & Foundry Motors. These buses will be used by the company's highway subsidiary, the Motor Transportation Company of the South.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has ordered two Mack 230-in. 4-cylinder buses from the International Motor Company. Bodies will be of the Duralyte Aisle suburban type, manufactured by the General Aluminum Products Company, Los Angeles, Calif.

## Among the Manufacturers

**Tom Plunkett,** railroad representative of the **Goodyear Tire & Rubber Company,** with headquarters at Chicago, died in that city on July 12 after an extended illness.

Stockholders of the **Appleton Rubber Company,** Franklin, Mass., at a recent meeting elected the following officers: **H. O. Phillips,** president; **J. E. Cameron,** treasurer and general manager; **Paul O. Lawton,** secretary and assistant treasurer. Mr. Cameron was formerly sales manager of the Appleton Rubber Company.

**J. C. Rowold,** branch manager of the **Mack-International Motor Truck Corporation** at Miami, Fla., has been appointed branch manager at Charlotte, N. C. **R. W. Huffman,** branch manager at St. Petersburg, Fla., suceeds Mr. Rowold at Miami, and **W. N. Costello** has been appointed manager of the St. Petersburg branch, in place of Mr. Huffman, following the latter's transfer to Miami.

The **Yellow Truck & Coach Manufacturing Company,** Chicago, will erect at once a factory at Pontiac, Mich., which will eventually house all the manufacturing activities of the company, according to an announcement by Paul W. Seiler, president of the company. It is expected that the new plant will be completed and ready to put in operation by January 1, 1928.

**N. A. Finch, Jr.,** formerly assistant manager of the railway survey department of the Yellow Truck & Coach Manufacturing Company, Chicago, has become associated with the **Scarr Transportation Service,** consulting engineers, New York. Mr. Finch is an engineering graduate of Union College, Schenectady, N. Y., and during the world war served in the Motor Transport Corps of the U. S. Army. He was at one time associated with the Pierce Arrow Motor Car Company, Buffalo, N. Y., and later occupied the position of supervisor of motor transportation for the American Can Company.

**The Mack-International Motor Truck Corporation,** New York, has announced the election of five new vice-presidents as follows: **Roy A. Hauer, A. C. Fetzer, J. N. Bayne, K. M. Blake** and **O. J. Evers.** All have headquarters in New York, except Mr. Bayne, whose office is at Newark, N. J. Mr. Hauer has up to the present time been general manager of the company's bus department and will continue as such. Mr. Fetzer, until his election as vice-president, was assistant general sales manager. Mr. Bayne was Newark branch manager and in his new capacity will be in charge of the newly created North Jersey division. Similarly Mr. Blake was manager of the corporation's New York branch, and will now direct the activities of the Greater New York division, newly formed. Mr. Evers has been on the sales force of the company for a good many years, handling national accounts and special assignments, and will continue in the sales department in his new capacity.

R. A. Hauer

A. C. Fetzer

J. N. Bayne


K. M. Blake

O. J. Evers